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# AIR TRAILS

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## FROM THE READER

All communications to the editorial offices should be addressed to Air Trails, 304 E. 45th St., New York 17, N. Y.

**Anybody Seen My Wakefield?** . . . I need some help in trying to locate a lost model. My brand-new Wakefield disappeared straight up on its fourth test hop with only two hundred turns in the motor. The ship weighed 9½ oz. and was a twin-rudder job covered with blue, yellow and red tissue. The model had neither my address nor a dethermalizer because I didn't think they were necessary on such a heavy model with only two hundred turns in the rubber. It went in an easterly direction from Staten Island and the thermal that took it would have lifted a barn door.

The model featured a removable prop, drawings for which I have sent to "Sketchbook" as possible interest to modelers who like to experiment with gadgets. Would like to hear from readers in the Brooklyn, Long Island area who may know the whereabouts of this ship.

Tom Matterfis, Jr.,  
62 Bush Ave., Staten Island 3, N. Y.

**Speak Up, Brooklyn & Queens!** . . . I am located in a town which seems to lack any model builders to the best of my knowledge. I wonder if you might be able to assist me in finding any in my section of Woodhaven (Queens) or nearby Richmond Hill, Jamaica or Brooklyn.

I am thirty years old and would like to meet interested fellow model builders near my age. I am interested mainly in free-flight but have done some work in control-line flying.

John Marotta,  
75-12 Jamaica Ave., Woodhaven 21, N. Y.

**South Africa Needs Plans** . . . Would it be possible to inquire of your readers whether they could oblige me with full-size, detailed plans of flying scale models of twin-engined and four-engined transport, passenger and war planes, suitable for radio-control?

G. D. Louw, 103, MacWilliams St.,  
Venterspost, Transvaal, South Africa

**Names of Aces** . . . I see by letters occasionally published in your magazine, from readers, great controversy on the subject of "Air Aces." I find them all very exciting.

I've been collecting data on "Aces" for 12 years, both W.W. I & II. My greatest difficulty is getting the names of U.S. pilots, USAF, USMC and USN. There are no sources of information in this part of the world to which one could turn.

It's for that reason that I would like to ask your readers to help me.

Patrick J. Cassidy, Jr., 16 Cretoria Rd.,  
Chingford, London E. 4, England

**Half-A Paradise** . . . I have been reading your swell magazine, off and on, for about three years. I enjoy the articles, Airmen of Vision page, the swell plans and designs, and all the rest of the magazine.

After looking through some past issues, I came upon the May, 1950, magazine and noted the "½A" Dawson Special. The plane interested me especially because I am trying to organize a neighborhood "Half-A" team racing club. We might use it, in addition to the Long Midget (Monogram), for our races. The only limitation we have thought of so far is that of engine size. We

will probably rule out anything larger than .05 cubic inch displacement. This will make possible the use of some of the smaller and more economical powerplants which the manufacturers are now producing.

The weather here in Salt Lake City is just "what the doctor ordered" for flying small planes. After the middle of April, there is little or no breeze and the weather is most always good. To add to the perfect setup, there are 2 large schoolyards, both amply spacious for U-control or racing cars. Could anyone ask for better conditions?

Nick Panas, Salt Lake City, Utah.

**New Stunt Rules?** . . . I have been an active modeler for ten years and have been flying stunt since '47. I would like to present here the best idea that ever occurred to me on how to improve the precision acrobatic rules. I think that due to higher performing glow engines and hotter fuels the stunt pattern is getting much too simple. I have given much thought to the bonus point system and also adopting the Mirror pattern, but both have disadvantages. Why not employ the system used at Miami to judge the big ones? In other words, take a pattern like the Mirror pattern and allow the contestant so many minutes (five for instance) to complete as many maneuvers as possible. Allow the contestant to choose his own sequence of maneuvers. Line length would have to be standardized.

This type of flying would place a premium on speed and turning radius of the model, a smooth running engine, and a good flyer with quick reflexes. This way the maneuver could be judged in the ordinary manner and there would be no quibbling over line angle or in the bonus point system. The ship would just have to fly fast and turn tight to win. I know by now you are thinking that most builders would go back to the larger engines but not so if engines up to 30 cu. in. were allowed 60 ft. of line and above .30, 70 ft. of line. There are "bugs" in any idea and I can see several in mine, but I think it would be an improvement.

Kenneth Fox, Alto, Texas

**More Radio Control** . . . First let me congratulate you on your wonderful magazine. It has just the right balance between full-size and model aviation. I particularly like Douglas Rolfe's Air Progress. However, I think you put too much emphasis on ½A; maybe I'm biased but I could do with more models and articles on radio-control. I've just completed a 5 ft. R/C ship with an Ohlsson 23 with 2-speed ignition. The receiver is a lightweight with an XFG1 valve. Total weight of radio equipment need only be 7 ozs. but I'm putting in heavier batteries.

In your magazine I often see photos of long processing queues. Surely this could be avoided by having two or three officials going round and making a random check of any models they think are underweight. They should check all high-place models. Any not qualifying should be disqualified from contests a year; it's tough but it would keep the models up to specification.

M. Dilly, Kent, England.  
(Continued on page 9)



# ....TIME IS IMPORTANT



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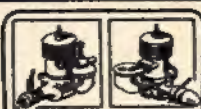
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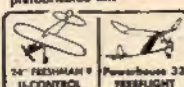
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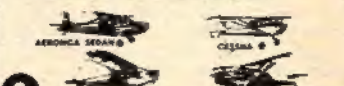
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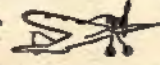
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A really beautiful red plastic job. 17" wingspan with Baby Spitfire engine, prop spinner, tank, etc., already installed. Shock-absorbing spring-steel landing gear, Jim Walker U-control for precision and stunt flying, plastic control handle, nylon control cord.



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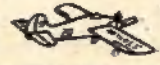


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10

## PLANE TALK

■ Among the bombs dropped over Korea, there appeared a new kind remarkable for enemy casualties—since it killed none at all. Yet it knocked thousands out of the war.

This Air Force weapon is the leaflet bomb which bursts in the air to shower advice for surrender. Though the idea is not new, the Air Speak that goes with it—the great voice from on high—makes the airborne part of psychological warfare a military innovation until recently a secret.

Though nine-tenths of the Red troops can't read, they can understand cartoons hinting good treatment for giving up, or else no end of bombs. So that nothing is left to imagination, comes the Air Speak—the voice from a mile above, shouting directions in the native tongue.

The Reds have quit in droves. Of 200,000 who surrendered, fully a third are credited to the persuasion of "Syke Air."

Results have led Air Force to fast expansion of this venture.

### OLD CHINESE CUSTOM

Of course the "war of nerves" is as old as Gideon who broke pitchers and waved lights. Worrying the foe with firecrackers, paper dragons, burning stenchies, and yells was an old custom of the Chinese who now have their awful bugles. Perhaps their belief in these things makes them the more susceptible to our adaptations, which are modern and scientific.

Though we have used propaganda and psychology of sorts in all wars, it was not until World War II that the term "psychological warfare" was used. We and our Allies dropped some 6 billion leaflets over Western Europe. In Japan, bomb warnings were scattered over cities to scare the workers out. Looking back, some authorities think this would have been good over Germany. It is to the credit of the Air Force that, even during the shattering demobilization when funds were so scarce, a planning staff for psychological warfare was kept in the Pentagon. The Army kept one too.

After the Korean War began, a special joint staff, representing all the services, was assembled in Tokyo and units were placed in the field. The staff job is to prepare literature and pictures—not general arguments

from the back files but fresh material geared to the immediate. On simple offset presses, leaflets were printed by the bale. The leaflet bomb now in use holds about 30,000. They are packed by native girls in a series of spirals. The bombs are set to explode at a certain distance above ground so that the pages are strewn to the winds.

Bundles may also be tossed out of airplane doors, on strings to pull the wrapper open.

The Air Force makes all the deliveries. Some 14 million leaflets per week have been the usual output in Korea—a heavy print order.

### THE VOICE

Two Douglas C-47s, specially equipped, have done the work. One is named "The Voice" and the other "The Speaker."

The Air Speak is a terrific thing—a bank of 36 loud speakers hung beneath the airplane nose with a metal baffle around them for streamlining. The set operates on 2,000 watts output. This horn is effective at 6,000 feet, which is high enough to avoid much danger from enemy fire.

Here is a typical incident. An Army liaison plane, directing artillery fire, asks the gunners to stop and talks by radio to one of the Air Speak C-47s. From these directions, the Chinese are told that if they will drop their guns and march down the road, they will be well treated. Otherwise the shelling will begin again. At once, dozens get up and are out of the war. For those who choose to (Continued on page 59)



M16M1 cluster adapter being loaded at Yokohama, Japan, with 22,500 (5"x8") psychological warfare leaflets wrapped in spirals.



(Continued from page 4)

Dalton James, Shreveport, La.

**Streamer Exchange:** With two Fireballs flying at a time, a streamer draped over the wing tip of the forward model is picked up on the wing tip of the following model.

At present I am employed by Boeing and out of curiosity showed my design to some of the engineers in the Preliminary Design Department. They thought it had promise but doubted stability requirements for a transport could be obtained with a tailless airplane. However, they showed great interest in the contest so you may see entries with the "Boeing touch" in the near future!

Philip Payley, Seattle, Wash.

### Most Powerful 1/2A engine

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# R-C

Around the modelplane radio-control circuit . . . comment and reports by a leading R-C authority

■ This seems a good place to answer questions on R-C that continually reach AIR TRAILS. Those most commonly asked, and the answers, are these:

(1) Is a license needed for R-C? Definitely; even for Citizens Band operation (on 465 mc.) an F.C.C. license is mandatory, but, on this band only, you need take no code or theory test.

(2) How can I get a license? Send 50¢ to Amer. Radio Relay League, West Hartford 7, Conn., for "License Manual"; gives all info needed for any class of amateur license, including Novice Class just announced. Novice test is simplest of all, but good only for 1 year, non-renewable. All other classes last 5 years, but exams are tougher. Code is best learned by two or more studying together; code-sending machines can be rented at low cost. Code transmissions for learners sent out regularly by W1AW, A.R.R.L. official station. Get a local amateur to help you; check on local radio clubs—they usually have beginner classes.

(3) Can I design and build my own R-C equipment? Not recommended unless you are an experienced radio technician. Build from magazine articles or from commercial R-C kits.

(4) Must I have an A.M.A. license to fly R-C? Not mandatory unless you're interested in fly-

ing at AMA-sanctioned meets.

(5) How many surfaces on plane must be radio-operated? Large majority of R-C planes have rudder control only. Most contests are won with this control; with experience you can do whip stalls, loops, spiral dives, wing-overs, etc. Addition of elevators means more flexibility, of course, but don't forget—the more equipment you use, the more can go wrong. Many R-C veterans feel best combo is rudder plus 2-speed motor operation; allows taxiing on ground, touch-and-go landings, really wicked stalls, etc.

(6) What is average weight of simple R-C installation and what size plane should I use? Rudder-only set-up using escapement will weigh about 16 oz., including fair-sized batteries; 5½ to 6 ft. span ship with Class B engine is good starting size.

(7) What are main general types of R-C now in use and what are their advantages? Escapement control most widely used is simple, light, gives neutral-right-neutral-left control sequence; motor cut-off easily added with a thermal switch. Proportional control requires more complication at transmitter; gives left or right movement in any degree needed and without sequence. Audio-tone operation requires rather heavy receiver but allows very flexible (Cont'd on page 15)



Western Air Lines pilot-captain Dick Schumacher achieved reputation as rubber and gas model designer, has now switched with great success to R-C. This is 42" span, 24 oz. midget.





*Jim Walker*  
**FIREBABY**

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*Jim Walker*



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## air notes

AVIATION TODAY  
AND TOMORROW

**MOSQUITO KILLERS**, lightplanes armed with machine guns and rockets, being considered as weapons against slow-flying enemy liaison planes and small ground targets. Both Beech and Temco have come up with models armed with cal. .30 mgs. . . **NORTHROP F-89** all-weather fighter in large-scale production at Hawthorne, Calif. plant. Late model does away with protruding mass balance on elevator, has smooth horizontal tail. . . **WINGS** of latest model Lockheed F-94C so thin that leading edge has no ribs; integral stiffeners, replacing ribs, are machined into the thick 75ST stock.

**DOUGLAS SKYROCKET**, high-speed research plane, flew higher and faster recently than Bell X-1. Figures on performance not released, but general guess is that its pilot Bill Bridgeman reached speed in neighborhood of 1200 mph, altitude above 65,000 ft. . . Landing speed of Skyrocket is around 190 mph. Wears out one set of tires per landing. . . **ONLY 87 B-36s** are ready for action in the USAF, according to Brig. Gen. W. C. Sweeney, Air Force Plans Officer. Sixty or so more are in process of modernization.

A **TURBO-PROP CARGO PLANE** designed by Lockheed Aircraft Corp. recently won AF design competition for this type. Ship carries Lockheed designation L-206, will look somewhat like Chase C-123. . . **TEN TON** bulldozer successfully parachuted out of a Fairchild C-119 cargo plane. . . **BEECHCRAFT'S** new twin-engine light transport has been ordered in quantity by USAF. Will be used as trainer, designated T-36. . . **KAISER-FRAZER CORP.** has purchased 49% of Chase Aircraft Co's stock. Chase C-123 to be built at the K-F Willow Run, Mich. plant. . . **COL. DAVID C. SCHILLING**, who flew a Republic F-84E from England to Maine nonstop using in-flight refueling, awarded the Harmon International Aviation Trophy. . . **JON D. CARSEY** of Dallas, Tex. was elected for second consecutive year as president of Soaring Society of America

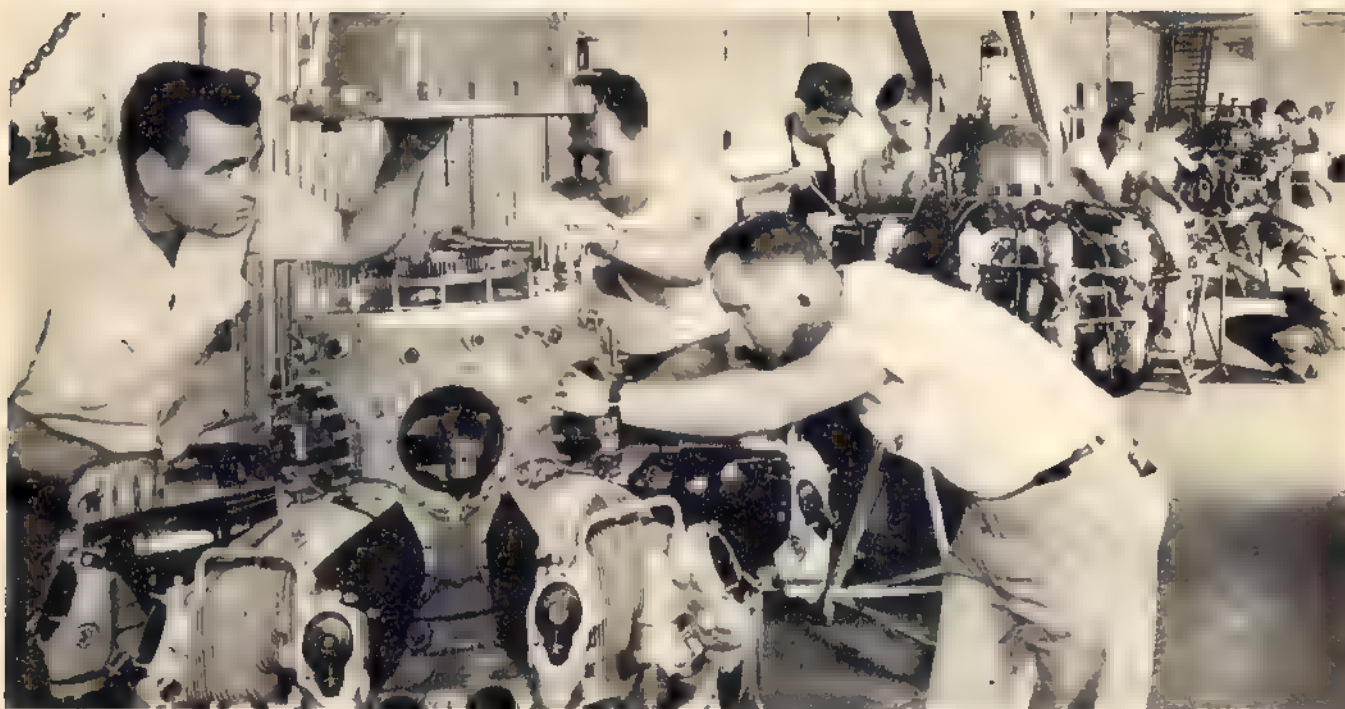
**FIRST DC-6B**, enlarged version of the popular airliner, to enter the service of a foreign airline was recently flown overseas to Switzerland where it was delivered to its owner, Swissair. . . **NORTH AMERICAN FJ-2 Fury**, Navy version of the F-86E Sabre, will be built in NAA's Columbus, Ohio, plant. . . **ACCORDING TO CAA**, there are 5,000 war surplus and other converted aircraft used in dusting, spraying, seeding and other agricultural operations. Half a billion pounds of chemicals, it is estimated, have been spread by airplane over farmlands of the U. S.

**CANADAIR LTD.** of Montreal is building 20 North American F-86E's per month for the RCAF. . . **AMONG FIRST** to be ordered on flood relief duty in Kansas area was Kansas Wing of Civil Air Patrol. . . **SPECIAL PAINT**, developed for high-speed aircraft, can add as much as 20 mph to a jet plane. . . **BINGHAMTON, N. Y.** recently opened its new \$4 million airport. Field has two 5,000 ft. and one 5600 ft. runways, is serviced by Robinson Airlines. . . **PRATT & WHITNEY** has licensed Continental Aviation & Engineering Corp. to build its 600 hp Wasp piston engine for military aircraft. This engine used in the T-6 trainer. . . **CONVAIR'S** Fort Worth division employment has reached World War II peak. Total figure over 30,000. . . **WORLD WAR II** hero Admiral H. B. Sallada (U.S.N. Retired; was responsible for capture of the Mariana Islands) has been named plant manager of Fairchild Aircraft Division, Chicago plant. . . **700 RACING DOGS** transported by air via Pan American Airways cargo Clippers to dog tracks in Cuba. . . **MARTIN P5M-1** Marlin, anti-submarine flying boat, recently made initial flight. Substantial number on order by Navy.

**FOUR** Pan American World Airways oldest pilots, Captains Basil Rowe, Robert H. Fatt, Roy Keeler and John T. Rogerson have logged an aggregate of 93,000 flight hours, more than any other four men in world.



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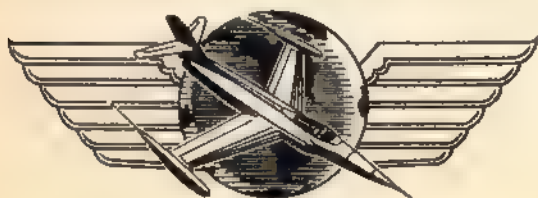
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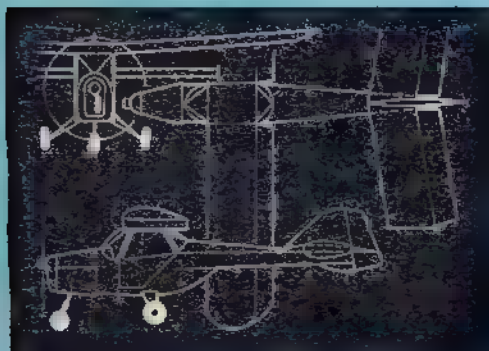
1926 ★ TWENTY-FIFTH ANNIVERSARY YEAR ★ 1951



# Airmen of Vision

## DESIGN COMPETITION

Best design of the month, a three-jet fighter-bomber by Lt. Roberto Sanchez Davalos of Mexico City, Mexico. Plane features swept-forward wing with a bi-convex airfoil, slats and spoilers. Interesting is location of the third jet, high on vertical fin. May present structural problems. Span 50 ft., length 61 ft. Engines develop 5000 lbs. thrust each. Top speed 650 mph. Heavy armament in nose.



Tandem wing lightplane by S. Slingsrall of Strommer, Norway. Main wing has an area of 73.5 sq. ft., rear wing 46.5 sq. ft. This type of design gives good stability, slow stalling speed. Quite similar to the French Toupin lightplane of 1937. Powered by a 40 to 50 hp engine, it has a top speed of over 100 mph and lands at 28 mph.



Boundary layer control glider by S. O. Rider of Stockholm, Sweden. Boundary layer is sucked off through slots at leading edge of wing by means of engine-driven pump to rear of pilot's seat. Considerable increase of wing efficiency is obtained through this method, as lift coefficient is doubled. Span 18 ft.; double flap, and aerodynamic fences at slots.



Air Trails has opened its columns to those who are interested in presenting plans for "aircraft of the future." Rules governing the competition are as follows: Three-view sketches of the proposed aircraft will be required. These should be not less than 8 1/2 x 11 inches for the entire three-views. Give sketches of the complete airplane in three-quarter front and rear positions. Photos of a model of proposed design may be included. Information on power plant(s) estimated performance, dimensions, and explanations of any unusual features are required. Data as to age, occupation or schooling of the entrant will be welcomed by the editors and

Judges. The designs may be of any type: commercial aircraft, military planes (fighters, bombers, troop transports), planes for the private flyer and single-engine sporting or racing craft. The entry each month judged the most practical or of the greatest significance will receive an award of \$25. Payments of \$5 will go to the runners-up. Entries will not be returned and for that reason those participating should keep copies of all material submitted. Mail entries to Airmen of Vision, c/o Air Trails, 304 E. 45th St., New York 17, N. Y. Editors regret that because of large number of entries they cannot enter into correspondence on A. of V.



## R-C

(Continued from page 10)

action of several control surfaces; seldom affected by interfering signals.

(8) I hear foreign R-C equipment made for the 50 mc. is being sold in U.S.—is this correct? English radio apparatus by Electronic Control Components may be had from American Telasco, Ltd., 55 W. 42nd St., N.Y. 18, N.Y. Another English line, made by Electronics Development, Inc. is available from Polks, 314 5th Ave., N.Y. 1, N.Y.

Guess that takes care of the questions for now—send them in, we'll answer 'em!

**More R-C Clubs.** Linden, N. J. area —The Flying Circuits group sparked by Fran McElwee, Cliff Schiebel and other very active R-C flyers. Contact them at 1400 Kenyon Ave., So. Plainfield, N. J.

Another Jersey R-C group (no official name yet) holds meetings at the Modelcraft Shop, 30 Orient Way, Rutherford, N. J. There are about 12 members with 10 ships among them. One father and two sons team have three ships flying; Pop has a fully equipped machine shop, is making some tricky new gadgets.

**Contest News.** Just learned from Walt Good that R-C Exhibition held at National Capitol Model Air show was changed to full-fledged event with prizes. Winners were scored by greatest accumulated flight time—but no flights counted unless ship landed in area 150 x 400 ft. Flights by rotation, those over 10 min. counted only as 10 min; 5 min. allowed flyer to get in air after name was called. Here's a simple set of rules for C.D.'s who are worried about judging stunts, etc.: just a timer needed. Wonder who persuaded the sponsors to make this one a real contest?

May-June issue of A.M.A. publication, *Model Aviation*, had tremendous list of 143 sanctioned model meets; 38 of these list F-F events and R-C is included in 13. Not so good a percentage, is it? But at least it's much better from the R-Cers' standpoint than before. Interesting to note that most meets listing R-C are sponsored by Plymouth dealers; even though R-C is not an official Plymouth International Event, these dealers know a crowd-drawing event when they see one. Another interesting point—at several of these Plymouth preliminary meets, R-C is the only F-F event! More power to Plymouth, and may they eventually include R-C at the Internationals.

Only sanctioned meet listing R-C after Sept. 1st is Prop Spinners 10th Annual Northeastern F-F to be held Sept. 16. Write to Bill Fletcher, 8708 Grand Avenue, Elmhurst, L. I., N. Y.

**Technical Notes.** Remember that hook-up we gave last issue for motor cut? Walt Good and others use thermal cut-out to stop motor as desired. Thermal heater element connected directly across escapement winding. With 4-arm escapement, motor cannot cut no matter how long you hold a turn. To stop motor, just push transmitter button for 10 sec. (or whatever delay period cut-out is adjusted for). Nothing new about this, of course, yet few R-C flyers use the scheme and it works beautifully.

Recent tests with an XFG-1 receiver and a crystal-controlled transmitter on

(Continued on page 17)

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## Western Prowlers



■ From aircraft plants of the West Coast come these two heavyweight sluggers, the Northrop F-89 Scorpion (above) and the Douglas F3D Skynight (below), Air Force and Navy answers to enemy bombers eager to sneak up on us under the cover of night or bad weather. Both types weigh almost as much as the Douglas DC-3, as they carry

over 1000 lbs. of intricate radar and electronic equipment which helps to ferret out the invisible enemy intruder. The Scorpion is armed with six 20-mm cannons and is equipped with split aileron decelerator air brakes which permit it to descend from 40,000 ft. in a matter of a couple of minutes. The Skynight is a carrier-borne aircraft in the 600 mph class but capable of landing at slow speeds. It also is heavily armed and has a crew escape hatch in the belly of the fuselage. Both planes have two engines and carry a crew of two.

Let enemy visitors beware!





(Continued from page 15)

27 mc. showed extremely good operation with very low input. Trans. power was 12 ma. at 135 V. to a single 1S4 tube. Vertical antenna used at both trans. and receiver. XFG-1 likes very low capacity across tuned circuit (we used only 4.7 mmf. with a slug-tuned coil) for real sensitivity. Details of the entire outfit will appear in Air Trails.

Several R-C experimenters have tried idea of eliminating escapement and its battery by building unit right into a sensitive relay. Can be made to work but is marginal with customary 1-tube receiver. Should be entirely practical with 2-tubers like Control Research conversion, which gives relatively huge current changes on even weak signals.

Speaking of escapements, some builders are making heavy duty jobs from surplus 6V relays. Rugged and really positive action had with low current drain.

Ever think of working R-C on 150 kilocycles? It's very reliable, but receiver is relatively complicated and current drain high. Also, range is very limited. Main advantage—no license of any sort required!

R-C planes are getting smaller and smaller. We've seen 3-footers that fly well. One of those who really understands the midgets is West Coaster Dick Schumacher with 42" job using Rudder-vator; wt. 24 oz.; flown with English Mills 1.3 cc diesel and with Cub .074. Note low dihedral—only 6 deg.; found to give much smoother action in and out of turns. Dick has built them down to 33". Who has one smaller—and still practical?

**Commercial News.** For those who find model airplane R-C a little too hectic (don't we all, at times?), Berkeley Models, West Hempstead, N. Y., will market 30" Chris Craft in fall. Berkeley, incidentally, now does most of their R-C test work in boats. Can't spin in, no waiting for good weather, no ships lost O.O.S. Sounds like Utopia.

Raytheon advises R-C they hope to start shipping RK61's to fill back-orders by September. They will try to build up a year's stock. All this, of course, unless vital defense orders prevent RK61 production, as they have since fall of 1960.

Apropos Half-A R-C jobs mentioned above, new tiny batteries are being made Eveready has #912 1½ V. flashlight cell, 1¼" x ¾" dia., weighs ¼ oz. For B battery, try Olin #0815 hearing aid job of 22½ V. and weighing .7 oz. (Also made in 15 and 30 V. equivalent sizes.)

Advanced R-C operators have often had use for DPDT sensitive relay. Well, there is such a thing. Sigma Instruments, 70 Ceylon St., Boston 22, Mass., makes one of about the same size as widely used Sigma 5F, and known as Series 52. They make another, Series 22, that has same double coil construction but only half the size. Takes more power, of course, to operate these double contact jobs, but relays are still "sensitive."

The Vernon C. MacNabb Co. advises us of an error in listing their two-arm self-neutralizing ½ oz. escapement last month. The current drain is 200 to 300 m.a. on two pencils, and not 400-600 as given by us. Sorry!

Guess this does it for the month. Don't fail to send R-C your Club news, contest news, or plain chit-chat to Ye Conductor, c/o Air Trails.

—HOWARD G. MCENTEE



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"SPITFIRE"  
special glow fuel  
below 50% rel  
humidity



"NITROL"  
most powerful  
contest fuel



"HI-THRUST"  
just what it suggests  
in contest glow fuel



"BLUE-BLAZER"  
tops in sport stunt  
fuel—least engine  
wear—lowest price



"INFANT  
THIMBLE GLOW"  
1/2 A—out of this  
world





1951 . . . First production of the Kaman HTK-1 for U. S. Navy on maiden flight.

## the Case of Charlie Kaman and his Curious 'Copter



1945 . . . Big (6'6") C. H. Kaman with original ground operated rotor test rig (auto frame).



1946 . . . Charles Kaman (left) chairman of the board and president of the Kaman Aircraft Corp. checks data taken on test rig with Bill Murray, now chief of flight test.

**This ex-modeler turned helicopter manufacturer parlayed a \$50 junk auto into an \$18 million Connecticut aircraft concern**

■ One warm summer day in 1945, 26-year-old Charlie Kaman drove into the automobile graveyard of a Hartford junk dealer, plunked down \$50 and towed away a sad-looking 1933 Pontiac. For the next few weeks the old heap was the center of much activity in the shop of an East Hartford manufacturing concern. A "face lifting" to end all face lifting was underway. When the job was finished the strange contraption was towed to Kaman's mother's home in West Hartford.

Speculation and puzzlement took over the entire neighborhood. What the neighbors saw bore little or no resemblance to an automobile. The chassis had been raised several feet above where Pontiac's engineers intended it to be. Two wheels were missing and the two remaining wheels were located where no self-respecting automobile would ever think of wearing its wheels. The rear end had been rotated 90 degrees so that one rear axle pointed up. The other rear axle was missing. A panel mounting a collection of dials and gauges stood up



## CHARLIE KAMAN AND HIS CURIOUS 'COPTER

alongside the engine. There was a weird assortment of steel braces here and there, a tow bar protruded from one end, a small third wheel was stuck underneath, and the gas tank had decided to move up closer to the engine.

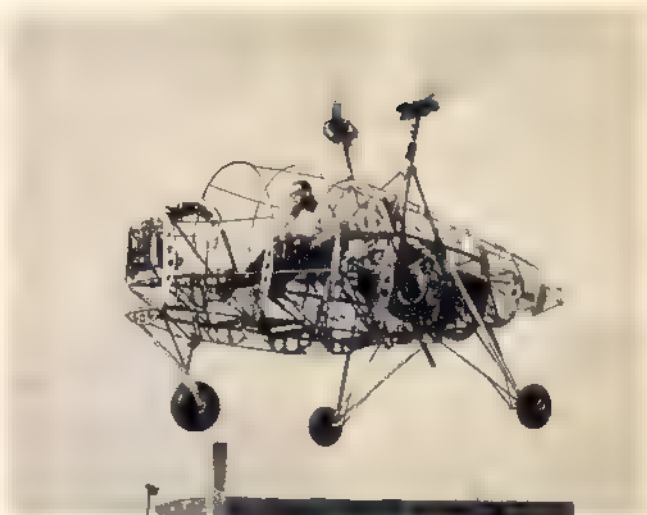
Many of Mrs. Kaman's neighbors had heard of her son's idea for a new kind of flying machine. Some of them, then and there, decided that: 1) the "thing" never would fly and, 2) Charlie Kaman's aircraft company probably wouldn't amount to very much. They were 50% right. The "thing" never would fly. It was designed and built to stay on terra firma like any other dignified automobile. It was, however, the first concrete evidence that Kaman's ideas on a new approach to solving certain helicopter design problems were being pursued with vigor. The "thing" was the ground-operated test rig on which full-scale rotors could be tested and valuable research and development data recorded.

Looking back a few more years to 1940, when members of the graduating class at Catholic University in Washington, D. C., lined up to receive their degrees, Charles H. Kaman, former record-holding model plane builder, was there to be presented a Magna Cum Laude in aeronautical engineering with the highest grades in the Engineering Department. Almost before the caps and gowns had been packed away to await the next year's graduates, Kaman turned up in the aerodynamics section of Hamilton Standard Propellers' Engineering Department. From then until the summer of 1945, when he left the East Hartford propeller concern, engineer Kaman applied his training to propeller and rotor aerodynamics. In doing so, he conceived his ideas on a way to simplify the helicopter's complex rotor control system. Those ideas evolved into the "servo-flap" rotor control which later resulted in the first fully servo-controlled helicopter to receive CAA certification and to go into production for commercial and military uses.

In the early days of Kaman Aircraft the cellar and garage of the Kaman residence were utilized for engineering and workshop. Friends and relatives became interested to the extent of helping financially through purchases of stock in the new company. Other friends, who were in the aeronautical engineering business, worked nights and weekends at Kaman's residence and took stock as pay for their services. Kaman's wife Helen, who had also done engineering work at Hamilton, left her drafting board only when it looked as though coffee and sandwiches were needed to keep the gang going.

With limited working capital, progress was slow at first. However, by mid-1946, enough engineering had been accomplished to prove that the "servo-flap" control was not only practical but that it had certain definite advantages. With this proof in hand, Kaman received financial support from New Enterprises Incorporated of Boston, and from an increasing number of individual investors. As the financial status of the company improved, the speed of the helicopter development increased. In January 1947, the experimental machine—the K-125—made its initial flight from Bradley Field, where the company had moved into larger quarters.

The first tangible evidence of the Navy Bureau of



In 1947 the original Kaman helicopter made its first flight. Unusual were the twin intermeshing rotors and "servo-flap" control system, features of all Kaman designed helicopters. Note absence of tail rotor.



The partially completed K-125 with Charlie at the controls. Ship now had its NX license, Navy became interested in design and awarded the struggling concern a small engineering development contract in 1947.

Aeronautics' interest in Kaman came in May 1947, in the form of a small engineering development contract. This was followed by another Navy engineering contract early in 1948. At the same time, possible commercial applications of rotary wing aircraft were explored and, in April 1949, the K-190 utility helicopter was certified by the CAA for commercial uses. A short time later an improved model, the K-225, received its CAA approval. The same summer Kaman helicopters were doing agricultural dusting and spraying in Connecticut, New York, Maine, North Carolina, and Florida.

Meanwhile the Navy's interest in the Kaman design continued via additional contracts. Early in 1950, two K-225's were delivered to the Navy and one K-225 went to the Coast Guard. The K-225's were purchased for evaluation testing by those services. Largely as a





Kaman K-225 spreading DDT over potato field near Syracuse, N. Y. K-225's have been sold to Navy, Coast Guard, Turkey, State of Miss.

result of the Navy's evaluation tests of the K-225, the company received its first big Navy production contract for HOK-1 helicopters in June 1950 prior to the start of the Korean war. This was followed in September by a production order for HTK-1 Navy trainer helicopters. The first HTK was rolled out and flown to Anacostia Naval Air Station, Washington, in April of this year.

In June 1950 Kaman employees totaled 23 and the company occupied one building on Bradley Field. Today, with an \$18,000,000 backlog of Navy orders, the company occupies eighteen buildings on Bradley, plus 8000 square feet of engineering offices in Hartford and has 540 employees. Expansion of facilities is continuing and it is anticipated that the start of production of HOK's will see a substantial increase in personnel. KAC can be proud of its accomplishments.



Bill Murray, chief of flight test, at controls of K-125 in 1948. Ship had twin rudders added by then. Kaman concern now has Navy contract to investigate application of Boeing 502-2 gas turbine in a 'copter.

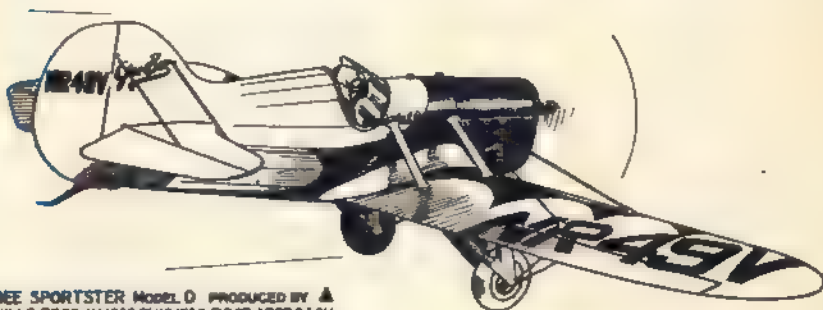


# AIR PROGRESS

By DOUGLAS ROLFE

## THE GEE BEE STORY

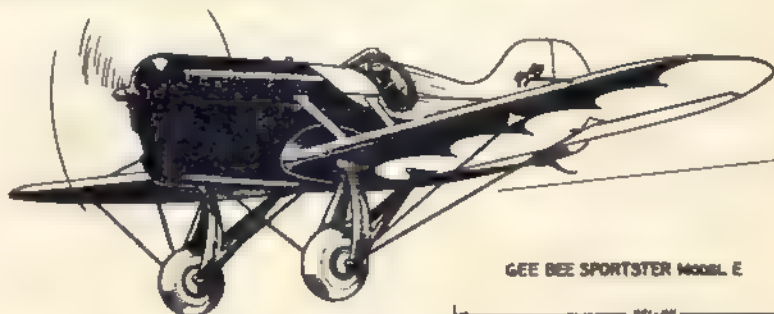
Most fabulous racers of all time... the record-breaking, trophy-winning "flying milkbottles"



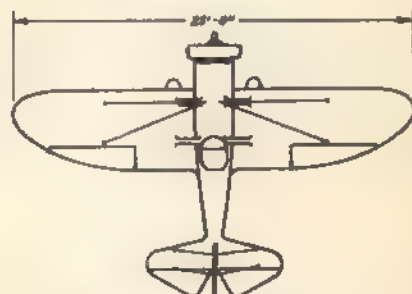
GEE BEE SPORTSTER MODEL D PRODUCED BY ▲ GRANTVILLE BROS. IN 1930 THIS WAS FIRST APPROACH TO THE NAMED GEE BEE RACERS. THE SEMI-CANTILEVER WINGS WERE EXTERNALLY BRACED AS SHOWN WITH STREAMLINE STEEL WIRE. VARIOUSLY POWERED WITH 85 AND 125 H.P. WEAHSCO OR 100 H.P. CURTIS ENGINES IT HAD A TOP SPEED OF 180 M.P.H. WITH 125 H.P. ENGINE ▼



GEE BEE SPORTSTER D



GEE BEE SPORTSTER MODEL E

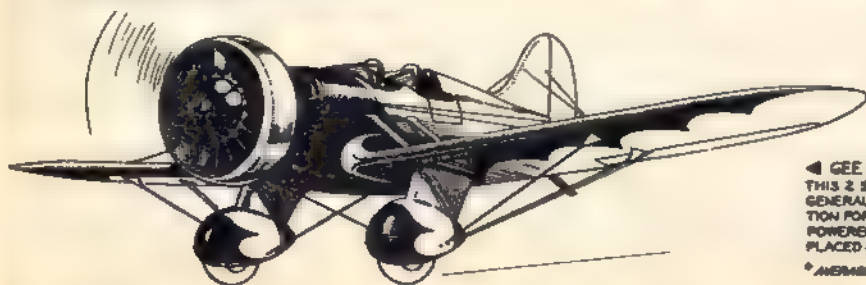


WIFE MODIFIED RUDDER & FIN

WIFE MODIFIED COCKPIT AND DOORS

TOWARD BRACING

GEE BEE SPORTSTER MODEL E WAS A ▲ MODIFICATION OF THE ORIGINAL MODEL D DESIGN. REFINEMENTS NOTICEABLE ARE FAIRED IN LANDING LEGS, IMPROVED RUDDER OUTLINE AND CLOSED-IN COCKPIT. WITH 100 H.P. WARNER SCARAB RADIAL ENGINE TOP SPEED WAS 140 M.P.H.



▲ GEE BEE SENIOR SPORTSTER MODEL YL THIS 2 SEAT MODIFICATION OF THE MODEL E IS GENERALLY REGARDED TODAY AS THE INSPIRATION FOR THE MODEL Z RACER. A SINGLE SEAT Y, POWERED WITH A 300 H.P. P&W WASP "C" ENGINE PLACED 4TH IN 1931 THOMPSON TROPHY RACES\*

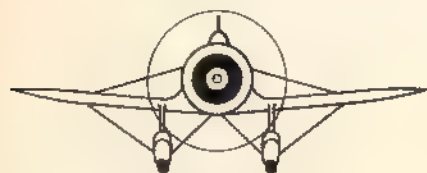
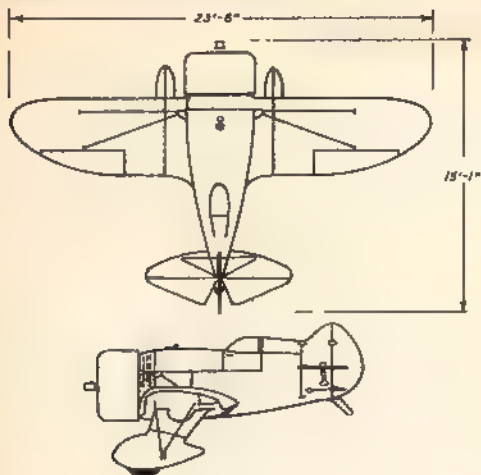
\* MEMBER SPEED 281.250 M.P.H.

In the early 1930's the most exciting racing airplanes in the world were the stubby, speedy little Gee Bee Racers which looked briefly across the aviation scene and then passed into obscurity. During their short reign they managed to win the coveted Thompson Trophy for two successive

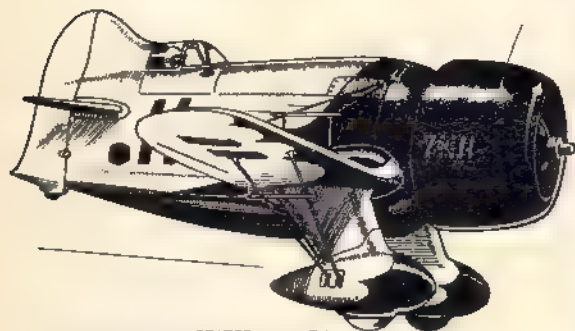
years and hang up an unofficial world's speed record for land planes. The general history of these externally braced, low-wing monoplanes is traced by the illustrations above.

The name "Gee Bee" was derived from the name of the original company, Grantville Brothers, which was in business in



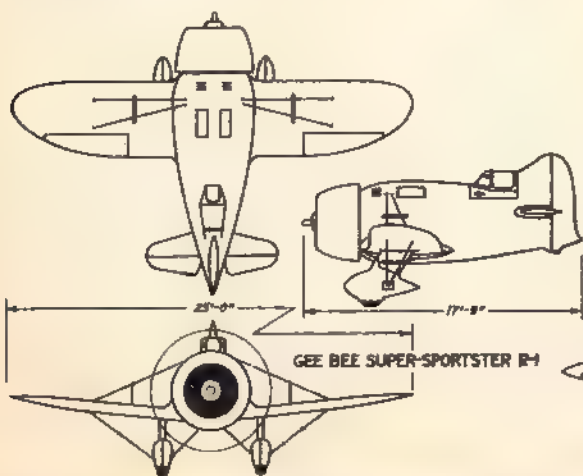


GEE BEE SUPER-SPORTSTER Z

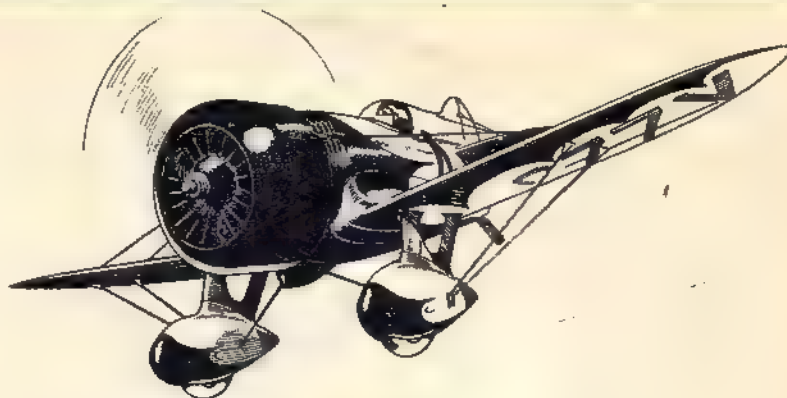


▲ GEE BEE SUPER SPORTSTER MODEL R-1  
WINNER OF THE 1932 THOMPSON TROPHY RACES IT WAS POWERED WITH AN 800 H.P.  
P & W HORNET RADIAL ENGINE \* A SISTER  
SHIP WAS FITTED WITH THE 535 H.P. WASP ▼

\* AVERAGE SPEED: 252 M.P.H. PILOT: JAS. DOOLITTLE



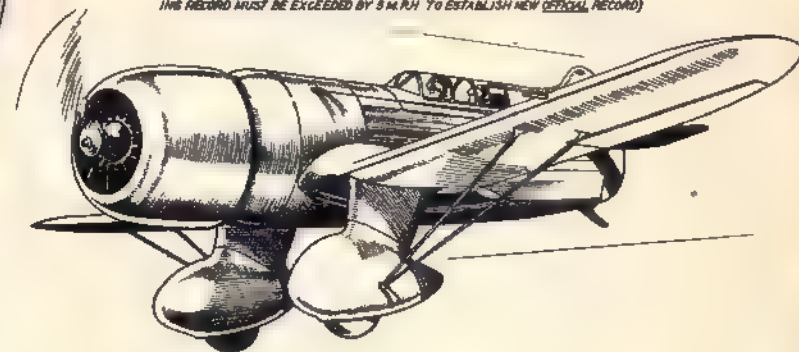
GEE BEE SUPER-SPORTSTER R-1



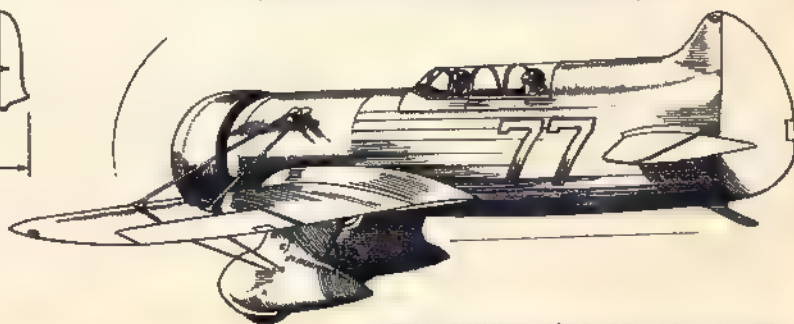
GEE BEE SUPER-SPORTSTER MODEL Z, FIRST OF THE ▲  
FAMED GEE BEE HIGH SPEED MONOPLANES AND WINNER OF THE  
1931 THOMPSON TROPHY RACES \*— IN NOVEMBER 1931 THE SAME  
◀ MACHINE EXCEEDED THE EXISTING WORLD'S SPEED RECORD FOR  
LANDPLANES. IN A FURTHER ATTEMPT TO ESTABLISH A NEW AND  
OFFICIAL \* RECORD IT CRASHED, KILLING THE WELL-KNOWN PILOT  
LOWELL BAYLES. ENGINE WAS A 535 H.P. P & W WASP JUNIOR ▼



\* AVERAGE SPEED: 286 M.P.H. — PILOT: LOWELL BAYLES  
† EXISTING RECORD: 279.3 M.P.H. BAYLES'S SPEED. 281.3 M.P.H. (BUT STAND-  
ING RECORD MUST BE EXCEEDED BY 5 M.P.H. TO ESTABLISH NEW OFFICIAL RECORD)



▲ LARGEST AND LAST GEE BEE RACER THE R-6 (OR  
"O.E.D.") WAS BUILT FOR JACQUELINE COCHRAN TO COM-  
PETE IN THE MACROBERTSON RACE \* IT WAS ALSO FLOWN  
IN THE 1934 BENDIX TROPHY RACES.—WINGSPAN WAS 33 FT  
3 IN., ENGINE A 700 H.P. PRATT & WHITNEY HORNET 35-E ▼



\* THE MACROBERTSON RACE (LONDON, ENGLAND, TO AUSTRALIA) TOOK  
PLACE IN 1934 — WAS WON BY THE SENSATIONAL DE HAYLLAND COMET

Springfield, Mass., in 1930. In 1933 the firm became The Granville Airplane Company and about 1934 this was changed to Granville, Miller and DeLoach. The latter company produced the model "O.E.D." expressly designed for Jacqueline Cochrane (now Mrs. Raynold Odham) for the MacRobertson

Race in 1934. The race from England to Australia. Although the Gee Bee first attracted attention in the 1931 Thompson Trophy Races, they had in fact proved to be more extraordinarily fast airplanes from the very start. The three Gee Bee airplanes shown here are substantially correct



# National Soaring Championships

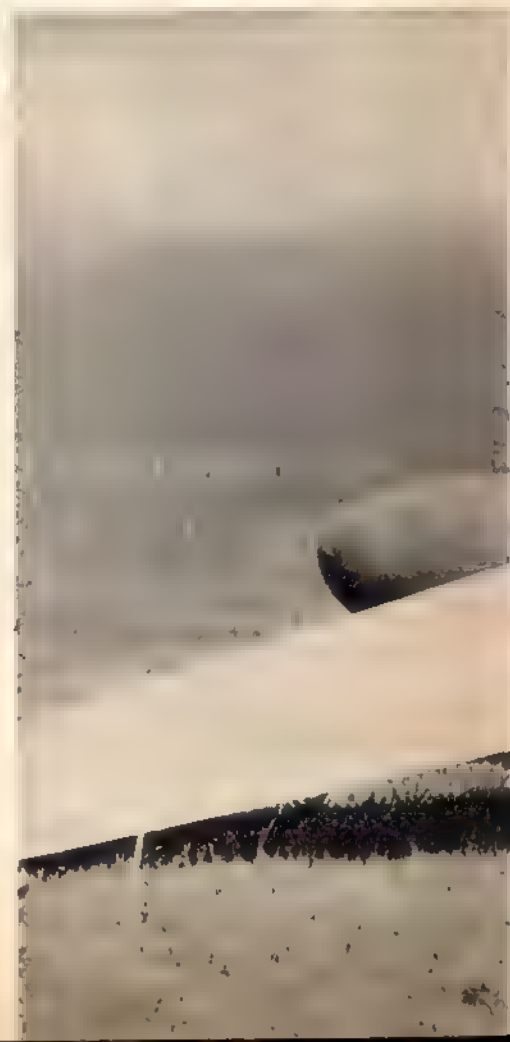
Longest flight in the history of the American movement highlighted this year's National Soaring Meet at Elmira



Above: Number ten, Dick Johnson's record-breaking sailplane the RJ-5, has an all-metal wing, aspect ratio 24, laminar flow airfoil, mahogany plywood fuselage. Glide ratio angle is 36 to 1.



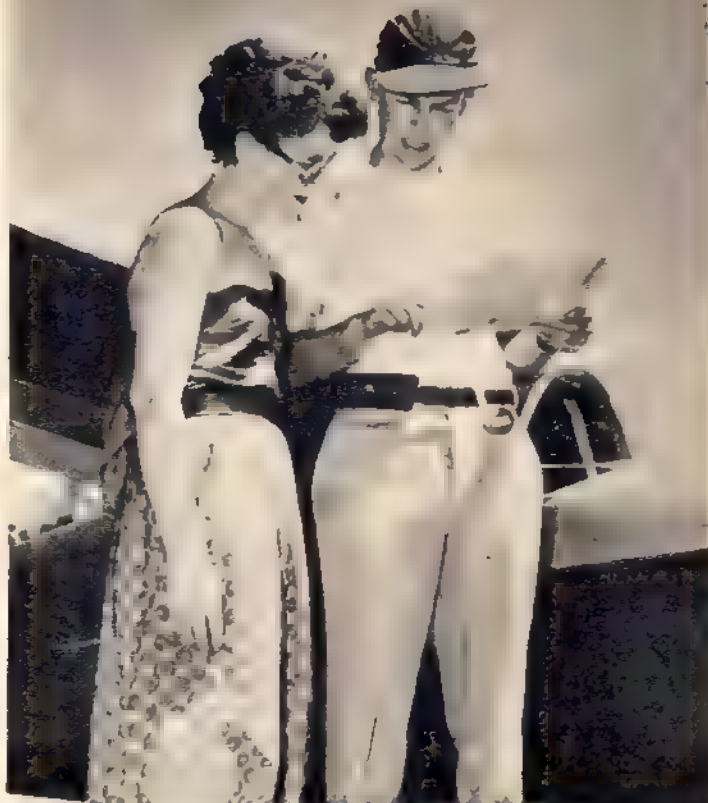
Above: The historic site where American soaring was born, Harris Hill, Elmira, N. Y., played host this year to 43 sailplanes and 50 soaring pilots participating in 18th National Soaring Contest. Large hangar in right foreground can house upward of 20 sailplanes, with storage for as many more on trailers in basement. Right: Kempes Trager's interesting sailplane has all-metal fuselage, "V" type tail and Laister-Kauffman wings.







■ The cream of the country's soaring pilots gathered once more this year at Elmira for the 18th Nationals and between July 4th and 12th soared a total distance of 2,710 miles. For the second consecutive year, Richard H. Johnson of Palm Springs, Calif., copped the championship title when on July 6th he soared from Harris Hill to Norfolk, Va., covering the 365 miles in eight hours. This bettered the previous U. S. distance record, held by John Robinson of Calif, by 40 miles. Second-place holder was Stanley Smith of Tonawanda, N. Y., third was William Coverdale of Chattanooga, Tenn., whose best flight was 213 miles. Women's title went to Betsy Woodward of Riderwood, Md.



Record team: Richard H. Johnson, U. S. National Soaring Champion and crew chief Miss Joan Brouillette. Johnson is one of the finest soaring pilots in the country; also established two-place distance record several years ago. The RJ-5, shown on upper left page, was built by him.





# Man-Monitored **MISSILE**







■ At a Black Sea station, say reports, the Russians continue the Nazi anti-aircraft scheme of a monitored man-ridden guided missile.

The German missile design was a cruciform wing and tailed supersonic affair monitored to the target by a pilot in a flying wedge aircraft carrying a radar-guide beam. While attached to the missile the control system of the wedge is electrically responsive to that of the missile, so that during the first part of the flight the monitor plane pilot flies both the missile and monitor aircraft.

The whole unit is launched at a very high angle—between 75 and 80 degrees. Until the pilot recovers from the jar of being launched, the unit is directed toward the target by ground radar. Then the human pilot takes over as the plane-and-missile reaches the general vicinity of an approaching enemy bomber formation.

The pilot-plane detaches from the missile, then directs the big machine into the bomber formation with its radar beam. Later, for a skid landing, the pilot plane drops major part of lower rudder.



# American MODEL CHAMPIONSHIPS

■ With the thermometer hovering around 100, the 20th National Championship Model Airplane Contest got underway at the Dallas, Texas, Naval Air Station, highlighted by the large number of Air Force, Navy, Marine and Army personnel entered. Sponsored by The National Exchange Club, the annual "Nationals" were presented by the Exchange Clubs of Dallas in cooperation with the U.S. Navy.



DALLAS NAVAL AIR STATION

Between six and seven hundred entrants flew in the six-day meet; the initial day's activity was curtailed considerably by high winds resulting from near-by line squalls. But this did not deter entrants who planed in from all parts of the world to compete. Canadian and Mexican flyers "came on their own" while 32 Air Force modelers representing officially that branch of the military service were flown in from 12 different AF Commands, some as far away as Japan, Tripoli and Germany.

Contest Director Maurice Teter, assisted by Dallas Exchangites, set up one of the best organized Nats. Many A.M.A. leaders helped in running off events. Following last year's example, a complete hangar was set aside for night-long building

## The NATIONAL MEETS





activity and popular bull sessions.

As typical Texas summertime flying weather set in, the contest got going with some excellent flight times. In towline glider top time was made by Dick Everett, San Diego, with a 7½', 860 sq. in., 49 oz. job that did 13:42.0 in the open class. Senior flyer Robert Aiduk, Kansas City, Kans., racked up 12:27.2; junior James Watson, Ft. Des Moines, Iowa, totaled 12:03.2. Top free flight Class B time was made by Ernie Shailor, Detroit, Mich., with Forster .29 original (to appear in AT) which turned in 21:41.4. Gene Jackman, Oklahoma City, was top junior flyer with Torpedo .29 entry and 15:29.7; senior James Carpenter, Lubbock, Texas, did 18:50 with a Torp .29.

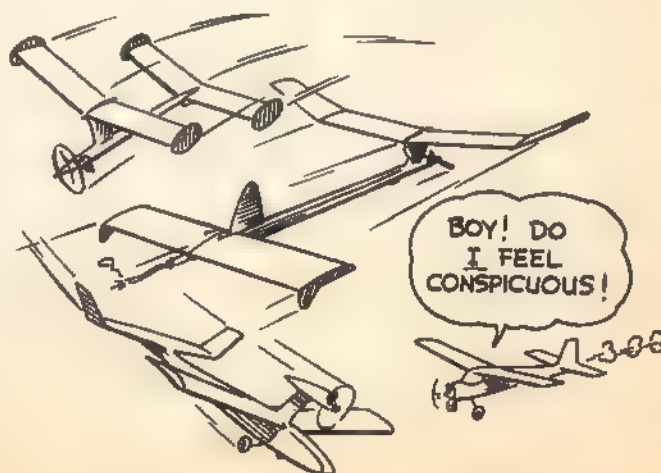
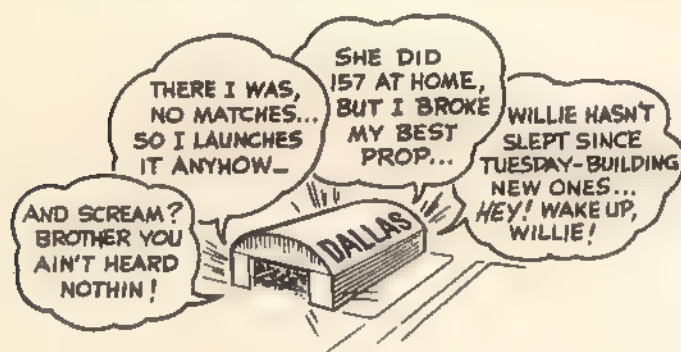
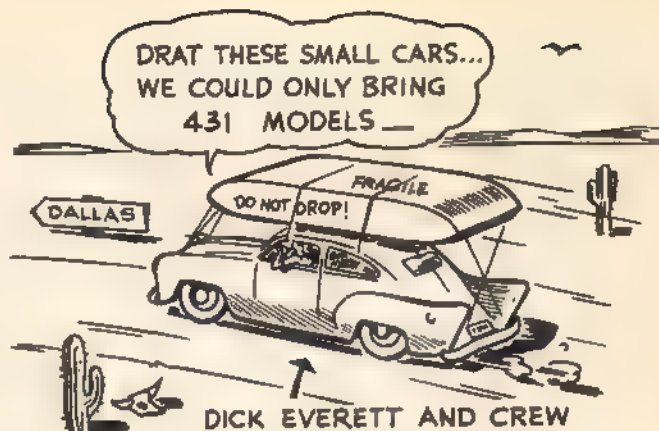
Class A speed saw some fancy flying with senior Robert Kautzman of New York City turning in 116.27 with a McCoy 19 job. The team of Pat Massey and Carl "Babe" Hall did 114.35 with their McCoy 19 powered Golden Rod (plans to appear in AT); junior Tommy Davis, Atlanta, Ga., was tops in his division by a speed of 110.56, using a McCoy 19. In the Class B speed event prop-producer Tony Grish, St. John, Ind., flew his McCoy powered White Fawn to a tremendous speed of 136.98. Junior Alfred Davis, Birmingham, Ala., with an original-Dooling did 127.29, and his brother Herbert took senior honors with a similar ship by a speed of 125.78. Using a Wakefield wing and tail utilizing a Gottingen 602 section, Dick Everett delivered best time in Half-A free flight—22:05; he used a Torp .045. Don Tune, Los Angeles, topped the juniors with 13:29 flying a Torp .045 Zeek. Jack McComb, Columbia, Mo., was the best senior flyer using a Wasp powered entry which turned in 15:07.6

total time. Most free flighters followed conventional low-weight, high-pylon formula.

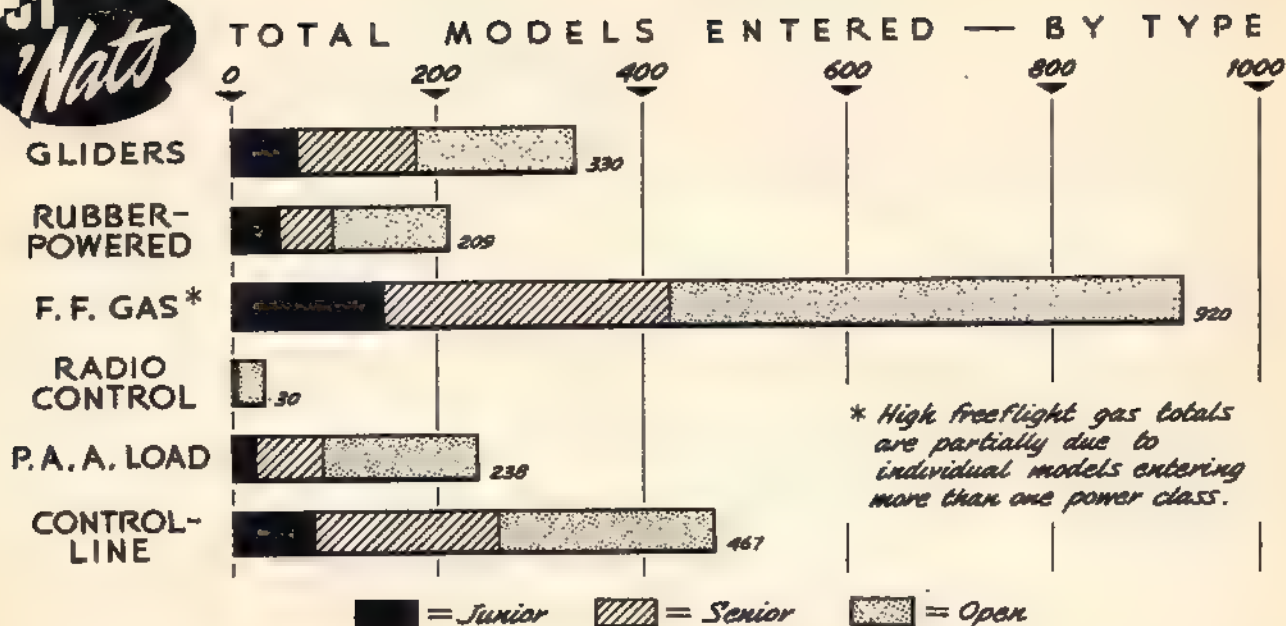
In the outdoor hand launched glider competition best time of the day was totaled by Bob Brawner of Phoenix, Ariz., whose 68 sq. in. entry did 16:44.6. A.M.A. Contest Board chairman Ray Matthews, Oklahoma City, flew an indoor glider with straight dihedral to a 15:26.1 time. Junior Gene Jackman, also of Oklahoma City, was first in his division with 6:44.7. The indoor events were held in the Fort Worth Will Rogers Memorial Auditorium under ideal conditions. Despite a relatively low ceiling, Don Tune, the Half-A free flight junior champ, racked up 41.9 seconds with a straight dihedral, constant chord, slightly swept wing hand-launched glider. A Chicago senior contestant, Charles D. Rushing, did 55.5 seconds while Joe Bilgri, San Jose, Calif., open flyer, did 55.2 seconds. Joe's glider, which has turned in well over a minute under slightly higher ceilings, will appear in AT.

In the team racing contest which saw some hot competition despite relatively few entries, Bob Lutker of Ft. Worth with a K&B .29 entry took first place. Bob had tough luck in radio control; the first man off in the contest, he cracked up on a succeeding flight.

In the indoor stick event George de la Mater of St. Johns, Mo., turned in high time of the day—21:47.5 as an open class







flyer. Junior Earl Hoggard, Tulsa, was tops with 10:51.4; Paul Simon, Detroit, was high senior flyer with 15:36.9. Open classman de la Mater repeated his top time performance in the indoor cabin category by doing 19:43.3. George has promised to send along the plans of his winning stick and cabin models so all AT readers can see what a real high-time indoor model looks like. Senior flyer Otto Heithecker, Chicago, turned in 9:41 and junior Steve Benovich, Detroit, did 3:51.6 in the same event.

About the most interesting and amusing competition was for rise-off-water free flight models. Relatively good conditions prevailed, better than last year by far, and some fine flights were made. Dan Lutz of Los Angeles flying an Arden .19 powered Zeek took 1st in the open class with 18:44.4. Edward R. Mates of Chicago, a very consistent R.O.W. contender, won senior honors with a Cub .09 powered original which will appear in a subsequent AT. Bill Lofland, Abilene, Texas, was ahead of the juniors with a Veco .29 powered plane which did 4:11.8. All these performances outdoors, incidentally, are the total of three flights.

Guilow Barnstormers swept two of the three first places in the precision aerobatic (stunt) competition. Lew Andrews of Norwood, Mass., the designer of the Barnstormer, garnered 382 points; his flying buddy, Donald E. Ferguson, Jr., of Newtonville, Mass., also using a Barnstormer, made top scoring total of the day and won senior honors with 389½ points. Junior flyer Harris Grimes of Atlanta, Ga., was first with 324 points. Both Andrews and Ferguson used Fox .35's, while Grimes was flying with a Veco .29.

The Wakefield rubber-powered contest provided some hot competition, literally and figuratively as the thermometer hovered around 100 and the rubber motors snapped left and right! When the final flights were in, top man turned out to be open class flyer Joe Bilgri with 13:18.8. Senior Otto Heithecker did 6:40.4 total time and junior Don Tune was high junior man with 7:17.6. At the same time Class C speed was run off with some good times, considering that the extremely hot conditions gave most flyers fuel troubles. Jimmy L. Price of Little Rock, Ark., was high junior with 121.29 mph. Jack Friedland, Oakland, Calif., was tops in the senior class with 137.51 mph. Open class flyer Lee A. Hill of Corpus Christi, Texas, racked up 136.88. Old-timer Sal Taibi, now of Long Beach, Calif., was crowned king of Class A free flight; flying in the open



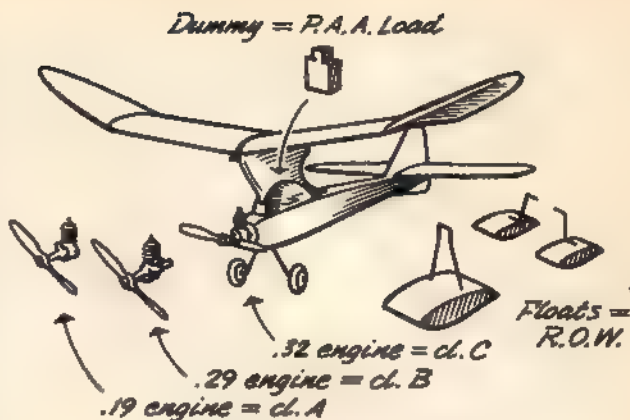
**AVERAGE CONTESTANT ENTERED 3.7 MODELS !**



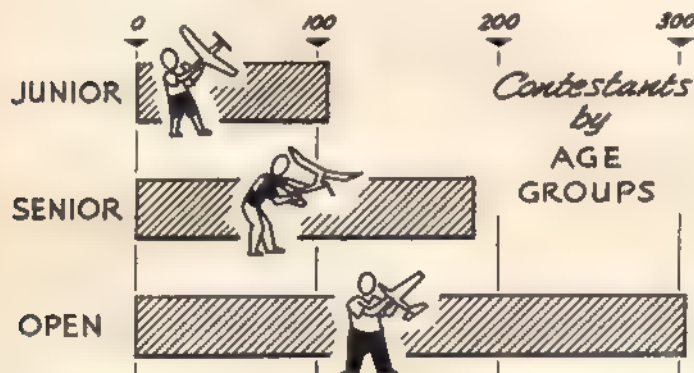
class he knocked off 27:44.1 to win. Bob Gelvin of Topeka, Kans., was best senior contender with 22:21.6. Richard Moore of Oklahoma City topped all juniors with 16:49.4. Gelvin and Moore used Arden .199's; Taibi used an Arden .099.

AT's old friend Frank Ehling of Jersey City, N. J. walked off with Half-A PAA-Load honors by flying a Torp .049 original job (to appear in a future issue) powered by a Torp .049. Frank's time as an open flyer was 15:31.4. Senior James P. Kohls of Detroit flew a Wasp model to 9:03. Junior Gene Jackman, Oklahoma City, did 9:06.8 with a Torp .049 plane. In the big size Class D speed event junior Harry J. Fiegel, Texas City, Texas, was fastest man of the day with 148.88 mph using a McCoy .60 in a 32 oz. model. Senior Herbert L. Davis used a Dooling .61 to get 148.76. Pat Massey and Carl Hall flew their big Golden Rod which was powered by a McCoy .60 to 146.69.

A disappointingly small number of entries were made in rubber-powered flying scale. Open class flyer Robert Bienenstein of Detroit flying a Berkeley Interstate Cadet left the competition stunned when his model flew for more than 9 minutes. He ended up with 236 points. Senior James Casper, Quincy, Ill., with a DH Puss Moth amassed 161 points. There were no junior flyers who qualified.



A SINGLE F.F. GASSIE CAN  
ENTER 5 DIFFERENT EVENTS!

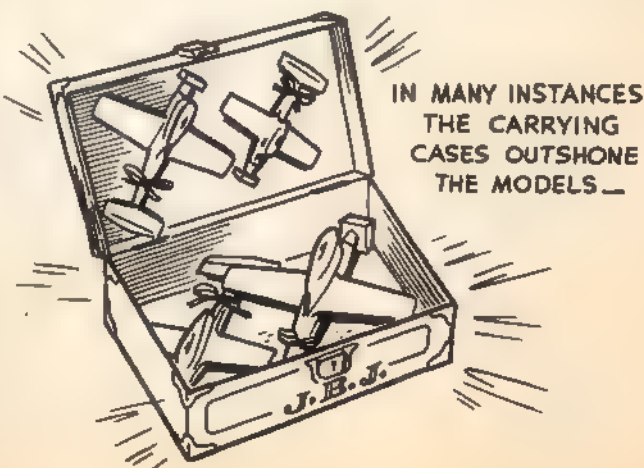


In the Class C free flight competition some mighty excellent totals were turned in. Open classman Robert L. Ottoman did 28:05.4 with a K&B .32 powered original. Senior Don Murray, West Point, Ga., used a Triumph .49 to get 22 minutes. Junior Curtis Franke, San Antonio, Texas, flew his Torp .32 powered entry to 18.43. In unlimited rubber flying Henry A. Cole, Jr., Mt. View, Calif., was highest with 15:00.9 in the open class. Senior Bob Brawner did 8:50.4. Cole's model had 220 sq. in. of wing area and weighed 8.8 oz.

Brawner's had 140 sq. in. and weighed 5.6 oz. Junior Ronald Nowicki, Detroit, using a 150 sq. in. model that weighed 6 oz., was high in his age group with 7:29.1.

In the radio control event final tabulations showed Jim Walker in a commanding lead with 271 points. Clifford Schaible, Roselle Park, N. J. won the Navy radio control bomb dropping event with 99½ points. Bob Lutker, Ft. Worth, flying an S.E.-5, took top honors in the Navy's carrier event with 225.45 points. PAA-Load A-B event was captured in the open class by the original PAA-Load winner, Herb Kothe, now of Grand Prairie, Tex. His Torp .29 ship flew for 15:19. In the senior class Michael Cook, Glendale, Ohio, was first with 3:36.6; he used an O&R .29. Top control line flying scale points (50) went to CPO John K. Abbott, USN, Corpus Christi, with a Corsair. Juel Clevenger took first in senior with an "AT" AT-6; he's from Kansas City, Mo.,; he scored 37.75 points. Jimmie McCroskey, Iredell, Tex. was first in junior with a P-51 and 22 pts.

In jet speed open class flyer Tommy Baker stationed in Tripoli took first with 140.73. Herbert L. Davis, Birmingham, Ala., was top senior with 142.63 mph; top junior was Tommy Davis, Atlanta, Ga., with 132.35. All winners used Dyna-Jet engines. In the PAA-Load (Continued on page 82)









■ The bird-like *Taube* (meaning Dove) was outstanding in the early development of aviation. First built in pre-World War I days, the characteristic wing and tail shapes gave it close resemblance to its namesake. As a military craft, built by many German aircraft manufacturers early in the war, it was seen in a number of variations.

Our semi-scale model follows the *Rumpler Taube* version which was powered by a 100 hp Mercedes engine (the six cylinders being mounted in pairs) and achieved a 70 mph speed.

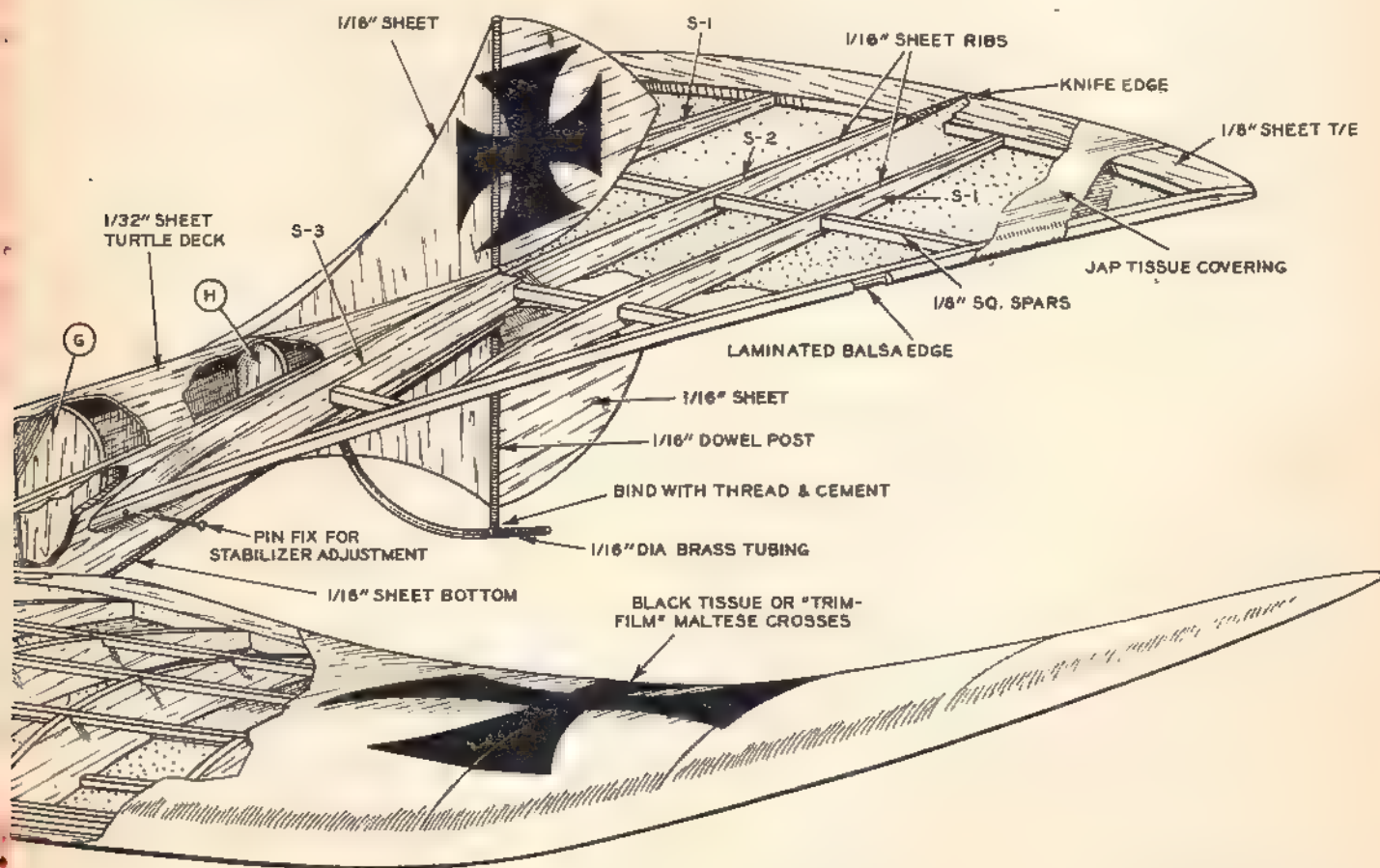
For realism in flight, the important scale features have been retained, but to make extended, stable flying possible, some distortions and liberties have been taken.

panels and a removable stabilizer make this possible.

As to flyability, the model has exceeded our original hopes; its climb is comparable to most Half-A ships, the glide being very smooth and graceful. Ready to fly, the model weighs six ounces and—since it soars readily—the builder would do well to install some type of dethermalizer.

Other engines of Half-A size are adaptable, in fact the *Taube* will fly realistically on the tiny .02 Infant Torpedo. Plans show installation of the .045 Baby Spitfire engine, though very little difficulty will be had in modifying the nose for installation of Cub, McCoy or Wasp engines.

Try to select light, straight-grained balsa for



The complex external wing bracing wires are omitted, and the swept wing tips employ slight polyhedral rather than the sharply washed-out rigging of the prototype.

One feature, unique in any type of scale job, is that the *Taube* may be easily knocked-down for convenient carrying. British style plug-in wing

fuselage sides—cutting them both from the same sheet if possible. This makes fuselage alignment easier.

Mark former locations on the sides and, beginning at the widest part of the fuselage, pin and cement the sheet formers in place.

Later add the bottom sheet and landing gear members. Build the wing "plug-in" box carefully, adding the center sheet bulkhead which assures



## RUMPLER "TAUBE"

the correct wing alignment. Engine mounting bolts are cemented firmly behind the firewall before installing it.

Dummy radiators add a bit of scale realism. However, the left one may be omitted if it interferes with timer or fuel shut-off installations. A timer cut-off can be installed in the front cockpit. Turtledeck sheeting is fitted and applied—the edge between the 1/16 inch sides and the 1/32 inch decking being sanded away.

Since some Half-A engines do not prime readily due to weak crankcase vacuum, the original model employed a gravity tank made to replace the rear dummy cylinders. Other tank installations are suitable. The simple aluminum exhaust shield or baffle is recommended to reduce the fire hazard and to keep the nose section clear of excess oil.

Thrust line can be raised if necessary in altering former "A" for installation of other engines, and the height of the dummy cylinders can be changed to match that of the engine's cylinder.

As modified from true scale, the wings are simple and efficient for model use. The curved, laminated leading edge is the only unusual aspect, and is another construction feature used widely in England. The strips are thoroughly water-soaked and, beginning with the inner one which is bent against a row of pins (working over the wing plan), the succeeding strips are pinned and liberally cemented to the proper outline. When dry the curvature is retained. Continue wing assembly with trailing edges, tip parts and ribs. Since the spar strips curve and pass the ribs at an angle, it is best to cut the notches in the outer ribs, as the spars (also water-soaked) are fitted.

Raise wing frame from the work board to add lower spars, then cut edges and spars as necessary to add polyhedral. Block to position and permit

wing to dry thoroughly. The plug-in tongue should be mounted parallel to the work board when the wing is blocked to correct dihedral. Cement it firmly and later check to see that it makes a firm friction fit in the fuselage box. Round off leading edges, taper trailing edges and tips and sand.

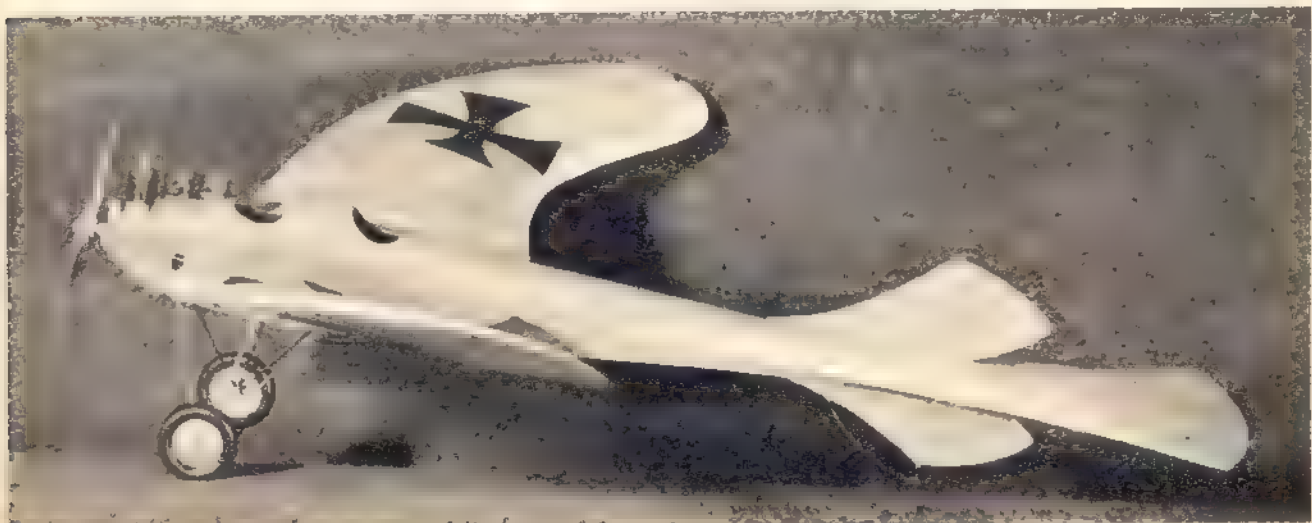
Laminated edges are used in the stabilizer, formed in same manner as the wing leading edges. Build the spars and ribs as one unit, the curved edges and trailing edge as another, then join the two after they have dried. Add the heavy inner ribs and sand the structure preparatory to covering.

Build the rudder of medium sheet, noting grain directions, and the small dowel stiffener. Tail skid is attached by binding and cementing as shown.

For once, dispense with the sponge donut wheels and dig up a pair of old-style hardwood wheels for realism. The gear struts are bent to shape, sewed and cemented to the fuselage, bound and soldered to axle. Simulate spokes by painting if desired.

Jap tissue is the covering material. We use and recommend Butyrate dope, which is used as ordinary clear dope but which is fuel proof and fire resistant. It is available in colors. Clear dope can be tinted or colored with dye, colors-in-oil, etc. Our Taube wings were left white with black Maltese crosses, the fuselage being painted a bright color. If you use Silkspan, add a plasticizer in the dope to avoid brittleness.

Balance the model near the back of the plug-in tongue. Add clay in nose or tail to achieve this C. G. location. Make hand glides to determine trim, adjusting stabilizer incidence as necessary. First power flights should be of short duration with rich setting. The Taube can be flown to right or left, although the original model climbed to the left in tight spirals and glided to left in large circles. Slight downthrust will likely be needed.

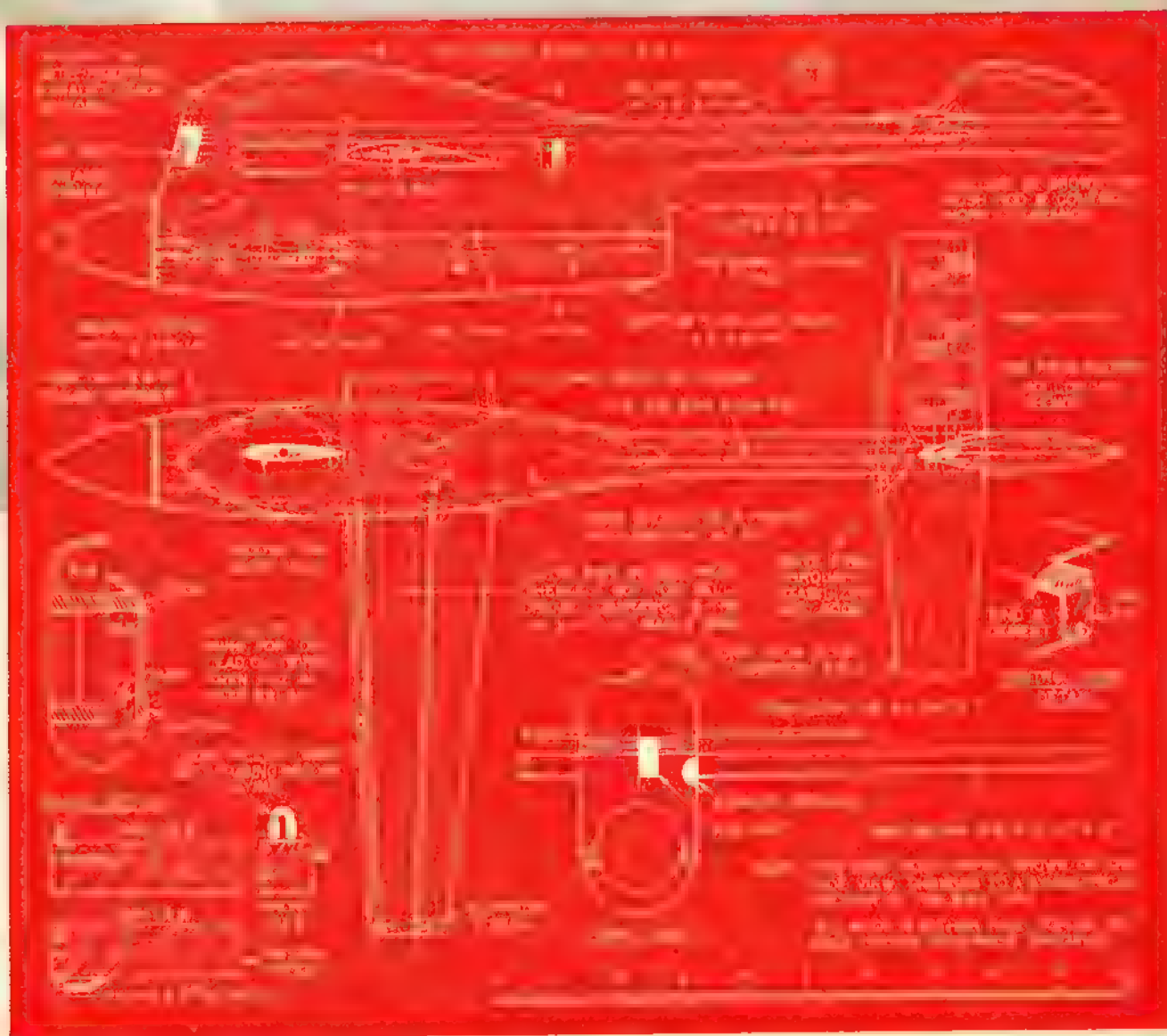
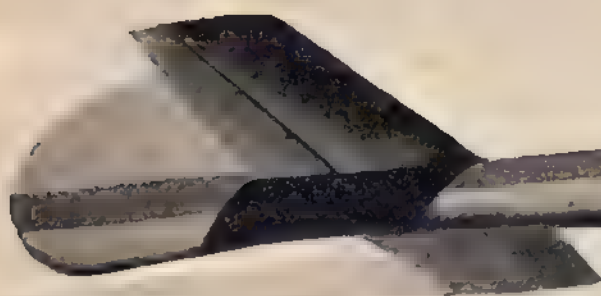


This model is a real flyer and has been in use for over a year. Ted has had some fine thermal flights; see unretouched photo on pg. 32.

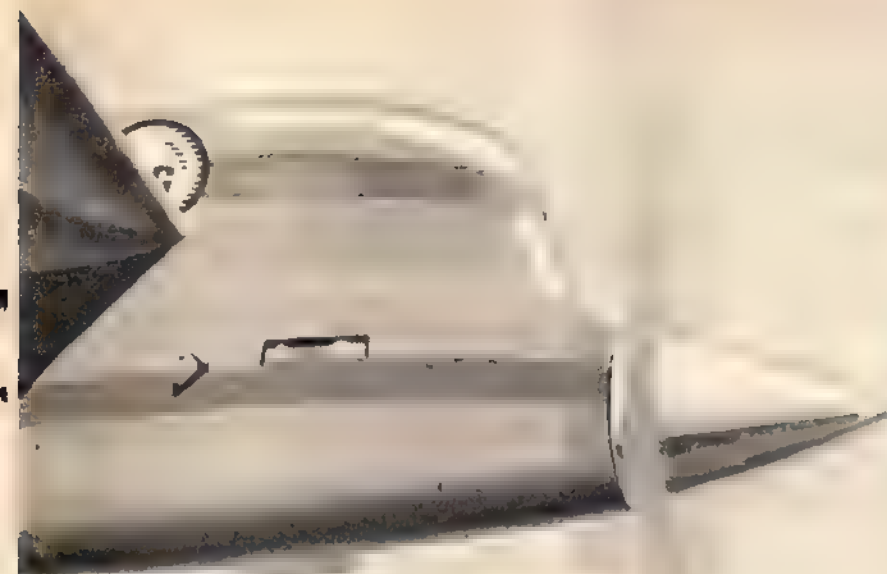












the

# FLING

**Contest winning speed model made of wood reverses the trend to metal, lowers costs, and is easier to build**

**By FLETCHER SLADE & ART HASSELBACH**



■ Capturing first place at a speed contest is the beginning of a new career for any modeler. After your first victory it is a constant battle to better your speeds, if only to prove that your previous victory was not the exception. Speed flying was a very vague step for the average modeler until a few years ago when special speed propellers, fuels and stock racing engines appeared on the market for the model consumer. Soon these "commercial" combinations were taking many first places at our big contests.

The opportunity afforded the beginner to purchase this merchandise put him right up with the top boys. Now, with present Class D speeds close to 160 mph we thought we would like to try a differently designed ship in the hope of setting a new speed record—the ultimate dream of all speed flyers. The first model we experimented with was a Class D ship and after the test flight we agreed this design had many possibilities.

In order to keep cost at a minimum we decided to

build a Class B ship. After several mock-up models were carved and completed, we selected the model illustrated in this article as our first choice for a fast and easy to fly speed job.

The original was powered with a Dooling .29 using a 7/10½ propeller and stock Hell Razor fuel. All the early test flights were very encouraging, despite the fact that these were made during the winter season. During the summer an impressive number of first places have been racked up in Eastern contests by *The Fling*.

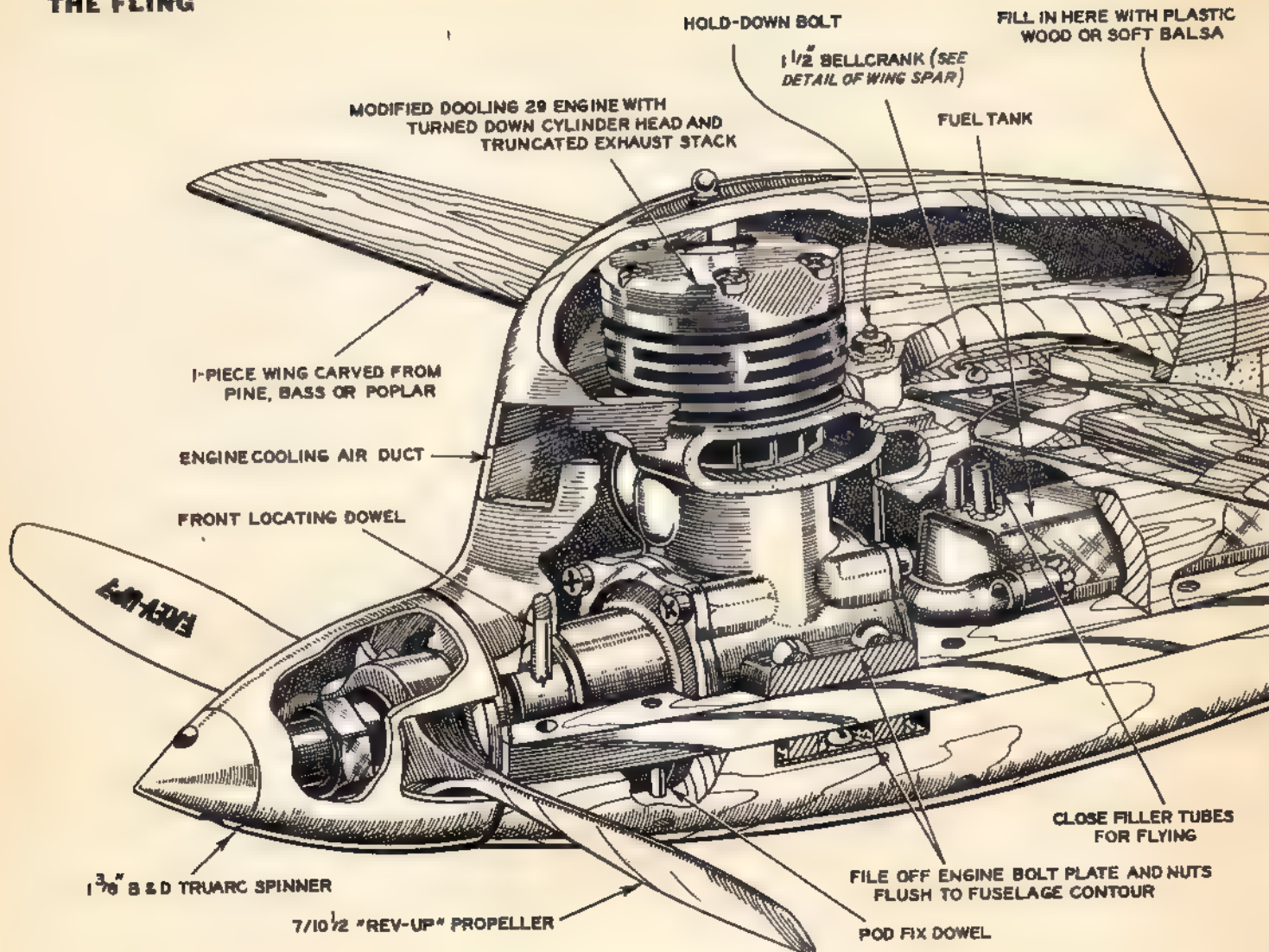
This model is constructed of poplar; two walnut crutches are used, one for the engine mounts and the other for the boom extension. A conventional type speed tank, rectangular in shape with a pinhole vent, proved most satisfactory.

One very important factor to be noted is that the wings and empennage are high. This will prevent model damage when you fly on rough circles.

Exploded view of fuselage assembly shows com-



## THE FLING



ponent parts. Upper assembly which carries wing and stabilizer is formed in three sections glued together. The lower pod assembly made from two pieces is held to the main assembly by a single bolt passed through the pod and bearing against the underside of the hardwood pod crutch and secured to the nut affixed to the boom section. Bread-and-butter construction makes for easy carving of the component parts. Note: the engine bolt fix plates must be put in position before completing the pod section, and both nuts and base plate filed off later to conform to fuselage contour.

Construction procedure is as follows: cut the walnut crutch to outline shape as shown on plan (including the engine mount set-up). Fasten the crutch to the bottom fuselage block (cement and dowel as indicated). When the cement is set, carve to the shape shown.

Cut the walnut boom as shown on the top view. Spot-glue top fairing block on top of the boom and then glue the fuselage top to the bottom of the walnut boom. When the cement is thoroughly set, carve to shape, then sand to a smooth finish. Carve the wing to conform with template shown on the plan. Insert the wing spar, then mount the bellcrank. Cut grooves for lead-out wires.

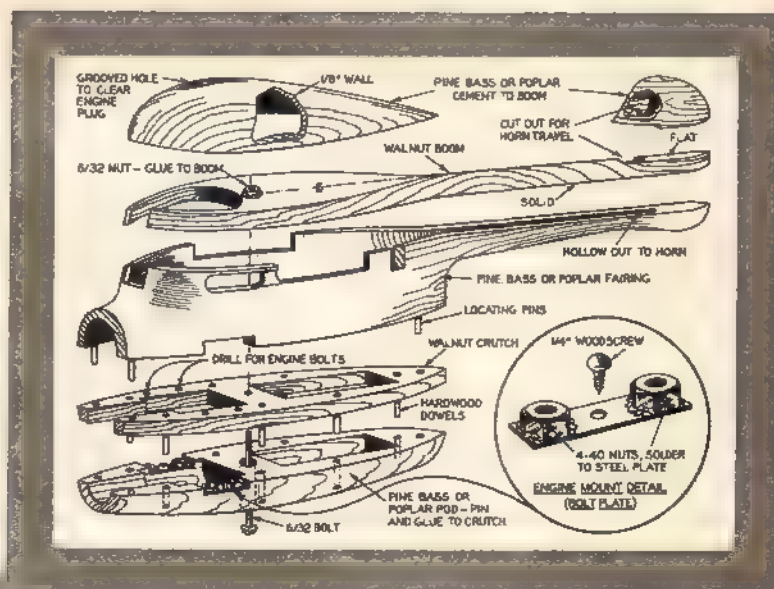
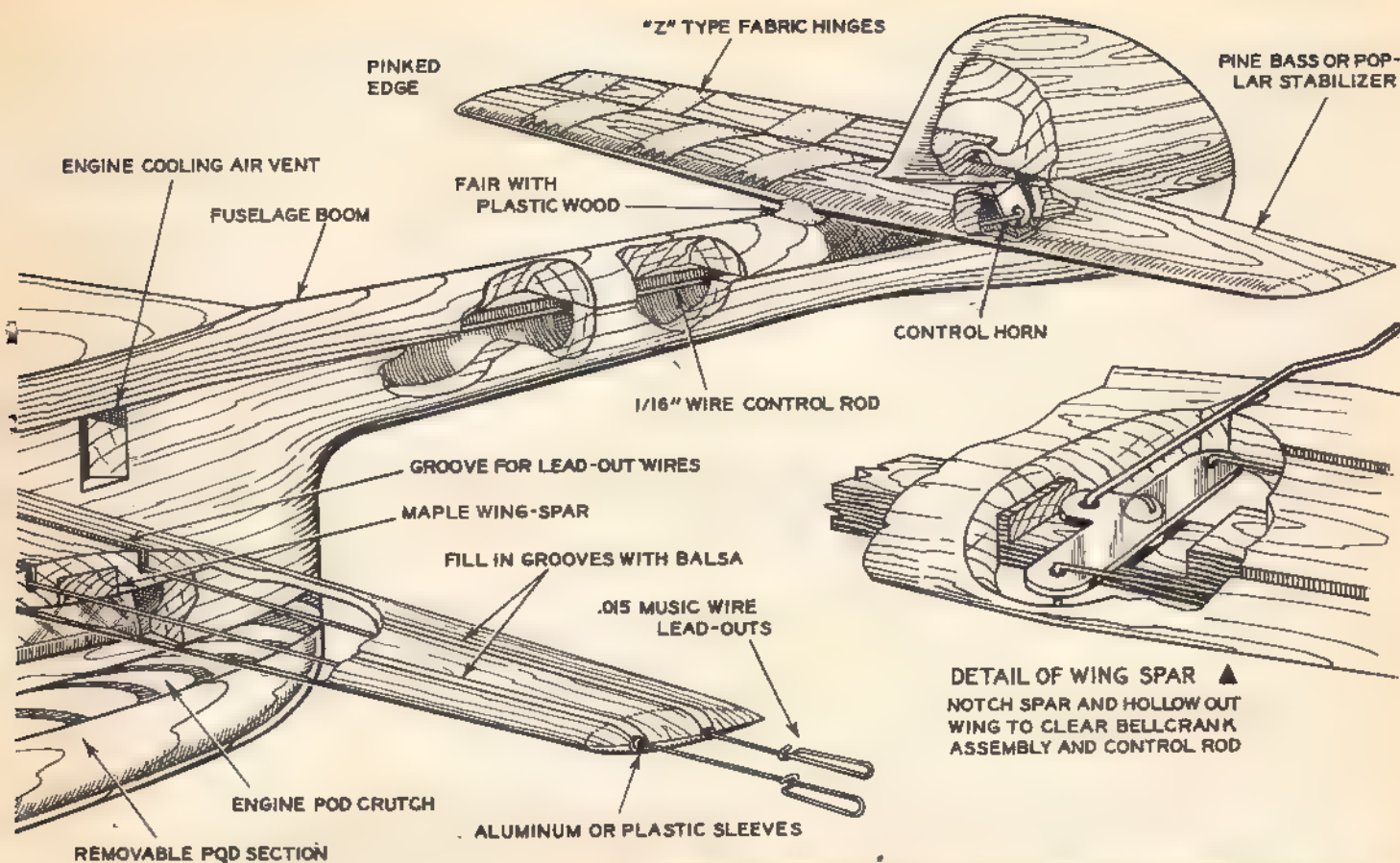
Take the fuselage top apart by breaking the spot-glued joint, then hollow the entire fuselage top and fairing to a thin wall. Leave the walnut boom solid. Cut out the top fuselage to insert the wing as indicated. Build elevator and stab as shown on plan, using Flightex hinges. Then cement in place. Drive two pins through elevator and boom. Install pushrod from elevator horn to bellcrank, connect lead-out wire, then cement entire top section together. Add rudder fairing as shown.

Finish-sand entire model. Then apply three coats of sanding sealer. Rub with fine 6/0 sandpaper, then wax. Install engine and tank. A regular tank with a pinhole is used. In flying you will find this model a very easy one to hand-launch, if it is released at zero incidence.

### Bill of Materials

Bottom fuselage block—bass, pine or poplar, 1" x 2" x 8 1/4"; walnut crutch (motor mount)—1/4" x 2" x 8 1/4"; fuselage top (not to be confused with the top fairing block)—pine, bass or poplar, 1 1/2" x 2" x 15 1/2"; walnut boom, 1/4" x 2" x 15 1/2"; top fairing block—bass, poplar or pine, 1" x 2" x 7"; rudder—bass, poplar or pine, 5/8" x 1" x 3"; wing—bass, poplar or pine, 3/4" x 2 1/2" x 15"; maple or walnut wing spar, 1/4" x 1/8" x 5"; stab and elevator—pine, poplar or bass, 1/2" x 1 1/8" x 7"; twelve inches of 1/8" dowel for pins; one 6/32" bolt 3" long; four 4-40 x 1/2" R.H. bolts; one 8" x 6" x .006" sheet tin for tank; 8" of 1/8" O.D. tubing for gas line; one 1 3/8" spinner.



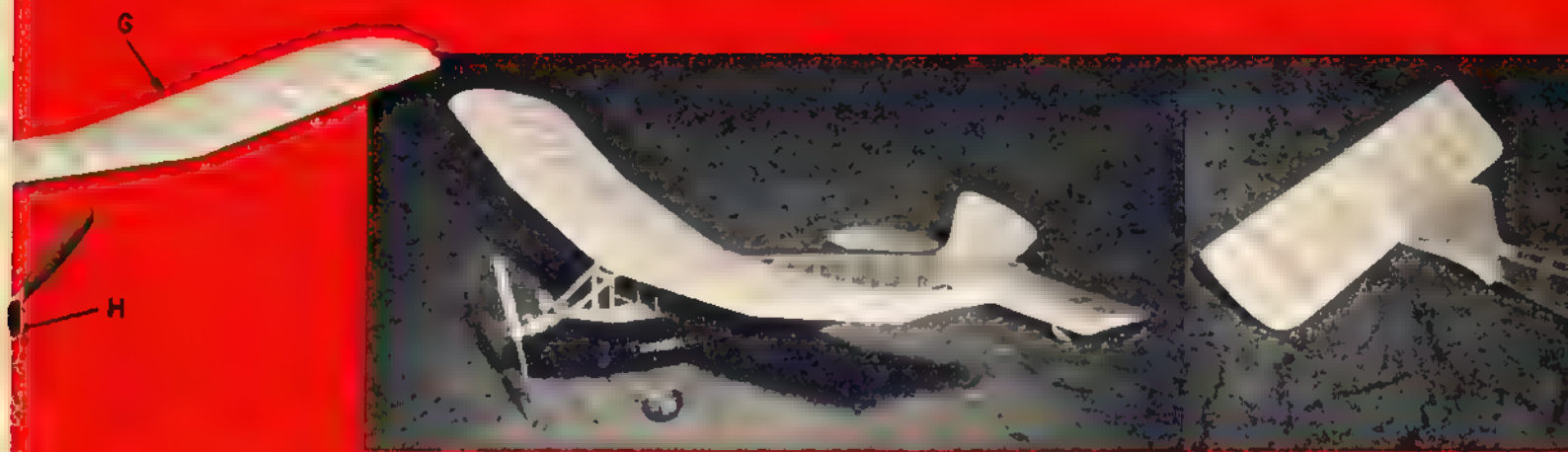


Remarkable feature of The Fling is its all-wood construction, a distinct departure from some recent speed jobs that required metal-turning equipment.









Plane features a pop-around dethermalizer to prevent the fin from being displaced each time the dethermalizer operates; one sub-rudder is pivoted on 1/16" dowel to handle turn adjustments. Wire clips hold the setting.

■ In designing a model for the Half-A Payload Event, it should be kept in mind that the take-off distance must be short. This means the model should produce a good amount of lift at low speed. Due to the high power output of Half-A engines, it was found that a model of Wakefield proportions would best suit the requirements. Flight test durations were over two minutes fully loaded—unloaded this model makes a fine free-flight competitor. The large cabin can be put to good use in carrying the necessary large loads for the new Clipper Cargo event, also.

Rather than employ the ultra-fabrication which many call simple, it was decided to be old-fashioned and have simple longeron, box construction. By using hard 1/8" balsa throughout the fuselage, adequate strength is supplied. Use of sheet fill-in at nose and tail adds much strength at the key points of impact.

Since the entire model is built around the occupant, this item should be made before fuselage sides are joined into a box. Choose pine wood for an occupant as it minimizes the amount of lead required to bring it up to weight. Weight is added by drilling a series of 1/4" holes in bottom of the occupant and filling them with melted solder.

Use rubber-bands, or pins, to fasten temporarily the fuselage sides to dummy. Cross-braces and formers are added to complete the body structure. You will find that by doing this you will have a jig which holds fuselage square and assures a snug fit for dummy. Liberal cement gussets at this stage will eliminate a lot of future trouble.

The landing gear wire is mounted between a balsa sandwich consisting of two sheets of hard 1/8" and 1/16" sheet filler. If the wire you use is slightly smaller, you should sand filler sheet down to match wire thickness.

Medium-hard, straight-grained sheet balsa is selected to form tail platform. Use two or three pieces of sheet to get proper width. The dethermalizer hinge is cemented to upper rear of this platform. Make this hinge from a piece of tubing and a length of paper clip wire which is soft and easy to align. Strengthen the hinge mounting by covering it with cloth or silk.

While fuselage sections are drying it is wise to save time by marking and cutting all parts needed to build the flying surfaces. Ribs can be marked, using a ball

point pen and balsa template. This method leaves dark, clean lines which are easy to follow during cutting process. After trimming, ribs should be sanded to their completed shape by stacking them into one pile and using a straight sanding block.

Forget about dihedral and build the wing frame flat. All spars are added in final stage. Only variation in the construction of stabilizer is use of a 1/4" rib as indicated on plans. This serves as the sub-rudder mount. When wing structure is dry it is cut apart at the dihedral points. Mount center section of one wing flat on a board and add the tip, following the indicated dihedral. When this is properly aligned, other wing panel is placed so that it is leading edge to leading edge with the first. Pin and glue this panel so that it aligns with the first. In this manner both wings are set at exactly the same dihedral. Both panels will be joined to complete the assembly, and then the spars will be added.

What happened to the half-ribs? These are added after the spars are dried into place. In making them fit do not exert pressure on spars as this will put irregular tension into wing and produce warps at a later stage. Tip blocks of soft 1/4" sheet are glued onto outer ribs. These blocks need not be pre-shaped as they can be easily carved after mounting. The necessary balsa gussets and cloth reinforcements are now added.

There is little to say about the rudder construction. Cut rudder and sub-rudders out of 1/8" sheet and sand them into airfoil shape. One of the sub-rudders has a short length of 1/16" dowel built into it. This dowel acts as the pivot for the variable sub-rudder adjustment.

For a firewall it has been found best to use at least 3/32" plywood. Cut and mount this onto the front of fuselage. A little sanding will bring it to proper size after glue has set. By using two pieces of 1/16" sheet and a soft balsa block you can build up a neat, simple cowl for your engine. Tack-cement this unit to firewall and then shape it with a sanding block.

Covering will increase the glide of any model, so get out your tissue or Silkspar and dope. Cover entire model, windows on fuselage and all. These sections are cut out after the first coat of dope has been applied. Use at least five or six coats of plasticized dope on entire model and sand (Continued on page 52)



IT'S WHAT'S IN BACK OF THE LABEL

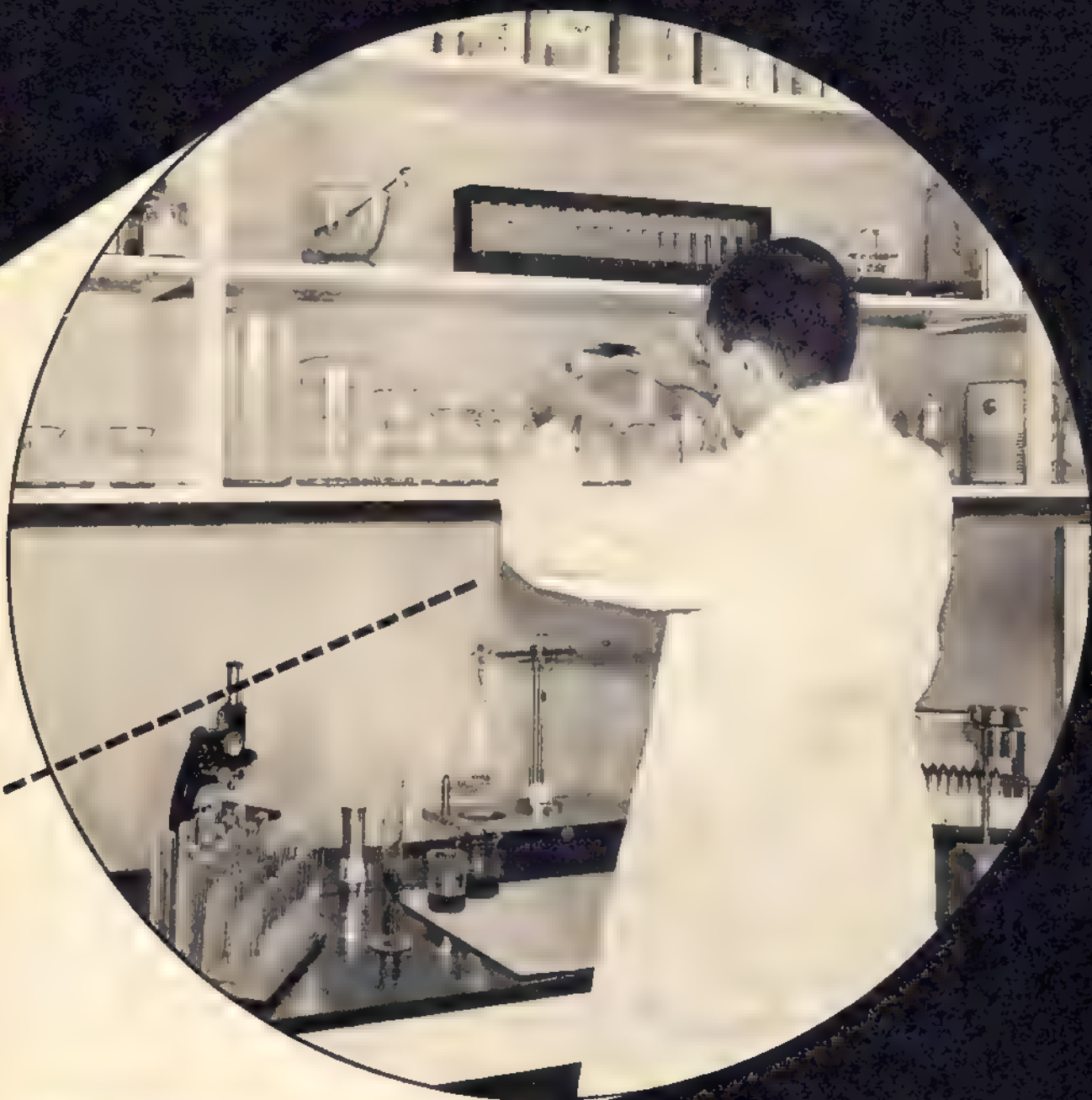
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## WEE WHIZZ WAGONS

One of the most popular categories in AT's design contest has been this one for Half-A speed jobs won by a U. S. Air Force sergeant.

■ "How many miles per hour?" is the question now heard 'round the world. So the speed boys have lots of company all over this planet, all interested in squeezing a few more miles out of an hour.

Sometimes an outsider may wonder what keeps the speed boys

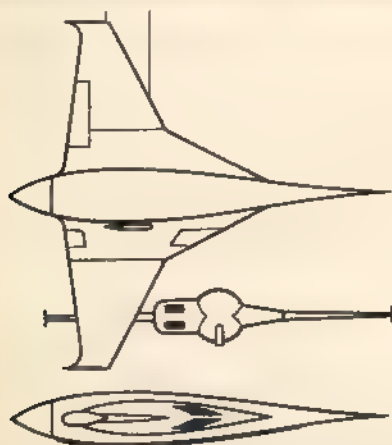
trying, year after year. When all is said and done, it is like any other competitive effort: trying to beat the other fellow if possible, in this instance his personal time. To accomplish this means research of some sort. Once a man starts on research, it is very hard to stop

him short. Ask any modeler!

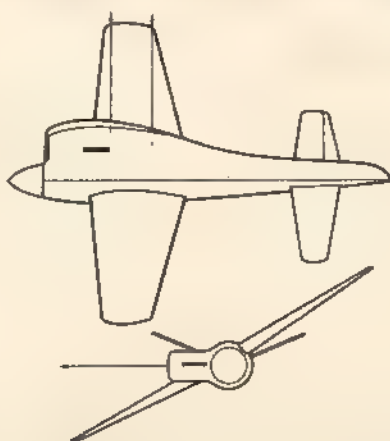
We hear talk about the speeds now being so high and the models so specialized that they are very difficult to duplicate and that newcomers do not have a chance. Yet, the very fact that records are high gives the newcomers something special to work toward. The feeling is good when you eventually get up there. Besides, even if the modeler never does reach the top, the effort will pay off in an all-around appreciation of speed and what it takes to add few more "miles per hour" to one's models.

We had quite a job in deciding on this month's winner, the model entered by USAF Sgt. James W. McConnell of Miami, Fla. As you can see, there are several entries which would be fun in trying. However, with an unusual design we would be taking a greater than 50-50 chance on the outcome. It might mean we would have to go through with a complete development of that design; so in a way we must balance our own experience in selecting the winner. We hope that the runner-ups will eventually try their ideas and let us know.

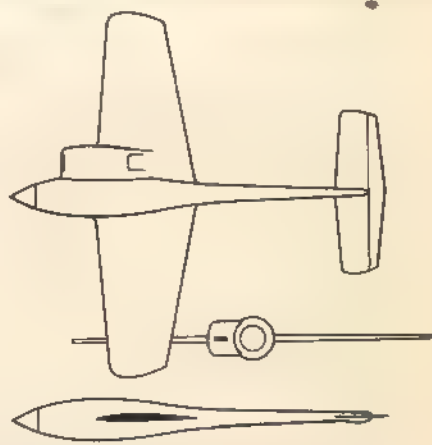
The conventional speed models have more or less settled into a certain lay-out formula: just enough wing area to obtain stability and level flight. If we stood on a tower, we could do without the wing and let centrifugal force keep the model from winding in around us.



All-wing "Skeeter" has 14.25 sq. in. of wing area and Baby Mac power. Airfoil is a neat diamond. Cpl. Thomas A. Hall, Essex, Md.



Wing built with 30 deg. bank in this Cub .074 entry by Gary G. Witt, Mankato, Minn. Sidewinder's fuse conventional; wing, thick.



Minimum frontal area design by Sgt. Robert F. Pouley, Barksdale AFB, La. Max. fuselage dia. 1 3/16"; boom is wrapped balsa tube.

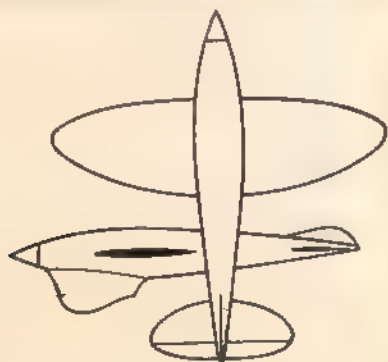


At one time we analyzed a 150 mph speed job as to lift while moving at 150 mph. Using the standard formula, we obtained a lift of 34 ozs. The model weighed 36 ozs. Thus, we were close enough to make us take theoretical aspects more seriously.

The airfoil used on Sgt. McConnell's model has a flat bottom with leading edge high up, almost like a streamlined airfoil. By calculation, we found that at 0 deg. angle of attack it would lift 34 ozs. at an impossible 150 mph. This means that the model was flying level at its minimum drag position. Then we assumed the stalling angle would be 6 deg., and found that its landing speed would be 68 mph. A bit more calculation gave us a centrifugal force pull of 34 pounds. By all this, one begins to see what goes on when a model is trying to pack in a few more miles per hour.

The winning design was modified slightly for construction. The layout was left alone. There is nothing startlingly new, but it is structurally possible and well proportioned. The streamlined airfoil might require about 1 deg. positive flight attitude to obtain the required lift for level flight. By having the flat bottomed portion behind the center of the wing, the airfoil should provide sufficient lift at 0 deg. at high speed to maintain a very flat, smooth circle.

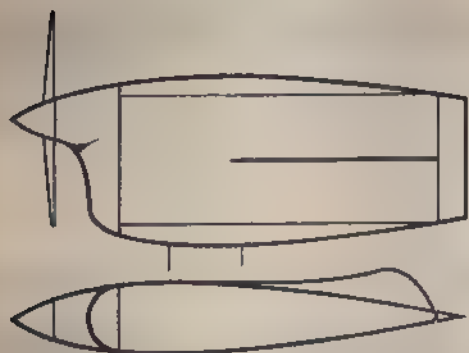
Begin construction with the



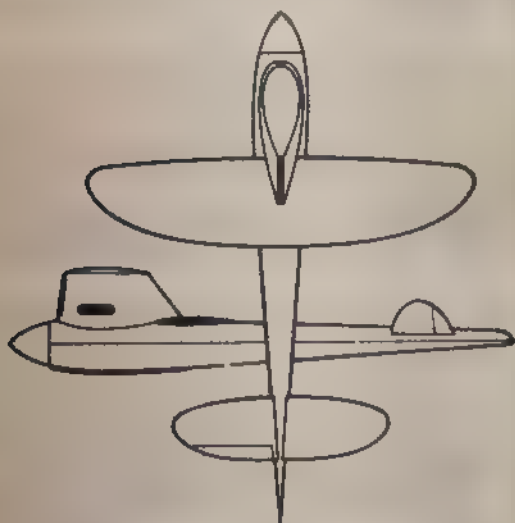
Inverted engine, round-the-pole or control line speedster by H. Fraser, Waterloo, Ont. Baby Mac; span & lg., 10"; 23.5 sq. in.



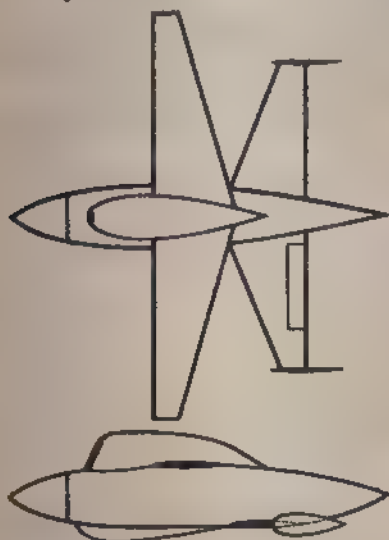
## WEE WHIZZ WAGONS



Engine side-mounted in "Flying Flounder" by AMC Tom Henebry, USN, Patuxent River, Md. Symm. wing section, 25 sq. in.; K&B .049.



From Havana, Cuba, this butterfly tail, Royal Spitfire powered smoothie. By S. A. Orrett. Span, 8 5/8"; lg., 11 5/16"; total wt., 4 1/2 oz.



Wasp powered Duo-Mono design by E. G. Mickelwright, Toronto, Ont. Span, 8 in.; lg., 7 5/16". Hollow fuse skid, bamboo rudder skids.

wing. Cut to outline given. To obtain a symmetrical airfoil, use this definite procedure: Draw a centerline all along the edges (thus dividing the thickness of the wing). Then cut flat-angled surfaces as shown. This will give you an approximate streamlined airfoil. Sand corners and you will have the wing section done. Sand smooth all over. Apply two coats of clear dope. Sand smooth. To obtain extra strength, dope with a 50-50 mixture of dope and cement. About two coats will do the trick. Again sand smooth.

Cut the stabilizer to outline and sand smooth. Round off corners. Give same dope treatment as the wing. If the stab tends to warp under dope, make another one using more dope and a plasticizer.

For the fuselage select the grade of balsa specified. If possible, use hard wood for the bottom shell. Draw center lines and outlines as shown. Use side and plan views to obtain the correct outlines. Cut out for fitting wing and stabilizer so that when blocks are assembled the two surfaces will be in correct place and properly lined up. By doing this now, you are assured of true line-up throughout the construction no matter how the cross section of the fuselage is carved later.

Cut and drill firewall to outline given. Now, take the bottom shell, mark the position of the firewall and carve out enough space so that the firewall will fit snugly. This will give you a base from which to carve the rest of the model.

Fix the engine to the firewall, and carve out the front portion of the shell until the engine fits so that its center is in line with the top of the shell. Cement firewall in place, using the engine to obtain zero thrust.

Drill top shell for cylinder and intake. Then carve out the portions that prevent the top shell from meeting the bottom shell. After the shells meet, cement-tack them together.

Before continuing, drill cylinder hole in the cowling. Cut and carve the cowling to shape. Fit it over

the engine so that it will rest on the top shell, which is still rectangular, and draw its outline on the shell. This provides the carving limits.

Cut the fuselage to an approximate top and side view. Work to obtain square or rectangular form to side and plan view. Don't start rounding until this is done. Next add the spinner to the engine, which is fixed to the firewall. Using the spinner as a "landmark," gradually carve the fuselage to cross section given. The outside of the fuselage can be finished to its final stage. Apply two coats of clear dope; follow by sanding. And then two coats of 50-50 mixture.

Separate the two halves and finish the internal carving. This is done by working gradually and checking the wall thickness. The thickness shown is approximate. If balsa is light, use thicker walls. Be sure to have generous thickness on the bottom to absorb landings. It is advisable to coat the bottom with several extra coats of 50-50 mixture.

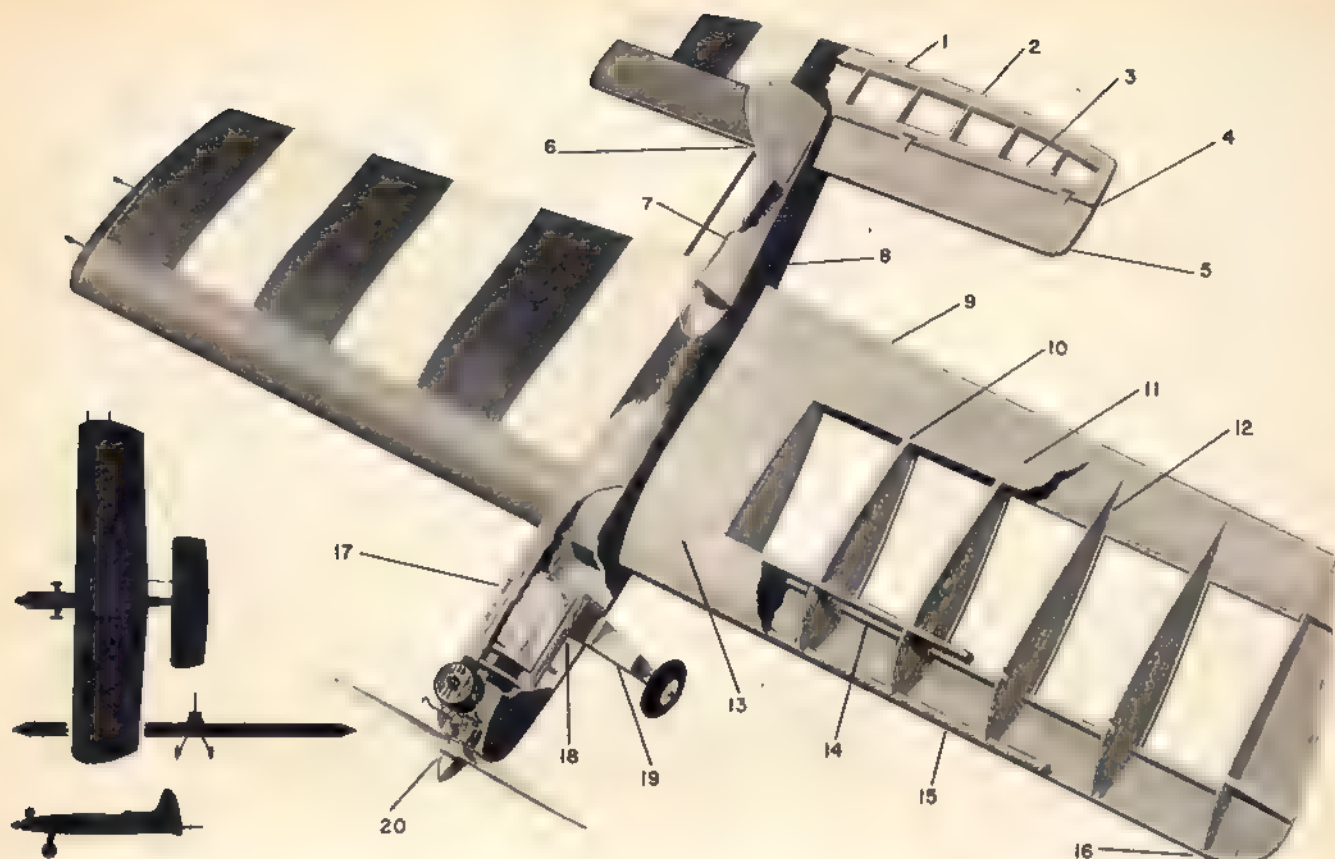
The firewall is now fixed solid by "filleting" with Plastic Wood. Note how nuts and washers are anchored to prevent turning. This is done by having the engine in place while Plastic Wood is drying. The bolts will loosen up when turned later. To make sure the nuts will not turn in case the Plastic Wood is not dry, cement them in place before applying it.

The two shells are held together with a bolt. Note how the nut is soldered to a brass sheet which in turn is keyed and cemented to a balsa block. Lots of cement all over will be a big help. The engine keys the shells in front.

Tank is cemented in place. You may have to relocate the top vent to provide for side filling or whatever you find necessary to give clearance for the bellcrank. Your tank selection will determine this construction.

The wing can now be fitted with the bellcrank. Top nut is soldered to a brass sheet to provide surface area (Continued on page 59)





(1) Sheet trailing edge cut to outline; (2) strip ribs; (3) spar strip; (4) dowel hinge; (5) sheet stabilizer; (6) sheet fin cut to outline; (7) sheet cabin covering; (8) sheet fuselage sides bottom & formers cut to outline; (9) sheet trailing edge; (10) cap strips; (11) trailing edge sheets top & bottom; (12) ribs cut to outline and notched;

(13) sheet covering for leading edge & center section; (14) square spar stock; (15) square leading edge; (16) sheet tips cut to outline; (17) shaped cowl block; (18) hardwood engine bearers & gear mount; (19) aluminum sheet landing gear shaped & formed; (20) engines .29 to .49 recommended.

Top star on Harold deBolt's All-American Team of control line models is this big stunter



**DESIGN:  
ALL-AMERICAN SR.**

**MADE BY:  
DMECO**

**CATEGORY:  
STUNT**

■ The latest and greatest in a series of models graduated in both price and complexity is now offered by deBolt Model Eng. Co., Williamsville, N. Y. The fourth ship of their All-American line, the *Senior*, is a big job, suited to the hottest engines in the .29-.49 group, and needless to say, it will do everything the most

experienced stunt man asks of it.

As a basic point of design, the *Senior* features Dmecco's exclusive "asymmetrical stability," which allows full stunt performance with no motor or rubber offset, and no weight in the outer wing. Though of more or less standard appearance, all components have been located with care, so as to provide the maximum possible in performance. Wing loading has been kept low by designer Harold deBolt, whose experience has shown there is no way to beat a light ship with lots of area.

The kit is made up of the highest grade of balsa selected for this particular plane. The wood is not die-cut, but is machined with the aid of master patterns and jigs. This makes it possible to use heavier grades of wood where needed, and in the sizes the designer specifies. Because of this manufacturing process, all parts are smooth-edged and ready for use.

The kit includes a cut and shaped dural landing gear that is similar in appearance to those seen on many team racers. The gear is springy, but very compact; it does not interfere with the fuel tank mounting, yet is a cinch to install.

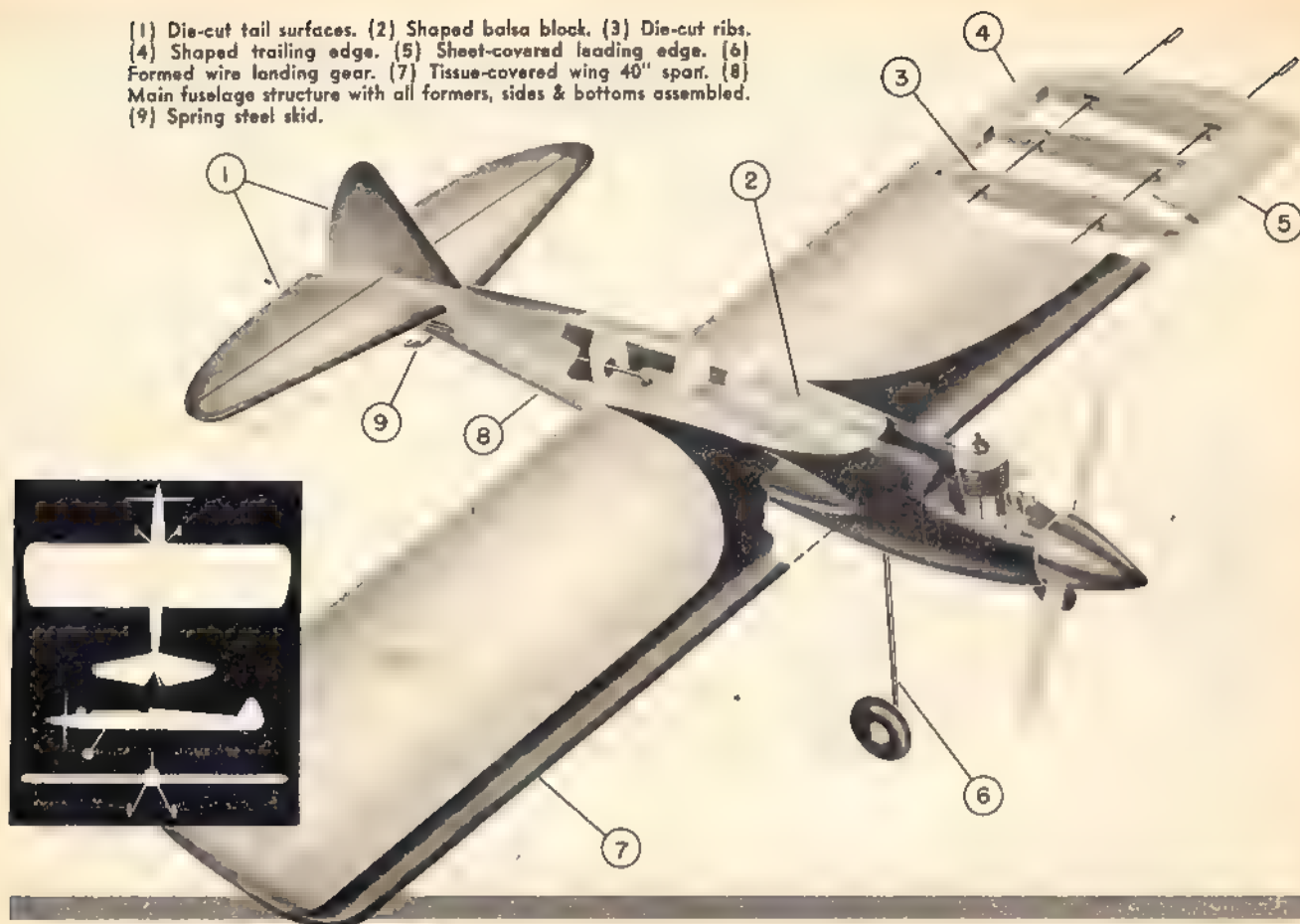
In some kits the builder reads vaguely that the plane is suited for engines from this size to that; not so with the *Senior*. A series of engines have been tested in it, and the plan carries a chart showing precisely which combinations of engine and prop worked out best. Even the proper fuel tank is specified exactly!

The plane has already scored within 10 points of perfect in four meets. Even at the Mirror Meet, where a really tough flight plan is enforced, the *Senior* scored 335 out of a possible 350 points.

Designer deBolt likes to fly exhibitions in a strong wind, and do the entire flight pattern, except level flight maneuvers, in less than a quarter of a lap! Would you like to try that with your stunt ship?

The *All-American Senior* is, of course, somewhat more complex than the earlier three ships of the series. However, assembly is actually easy, for you can build the wings right over the full-size plans, and the fuselage is a sort of rounded-off box. The finished ship weighs about 28 oz., quite light for a controliner with 510 sq. in. of wing area. Span is 51" and fuselage length 24½".

- (1) Die-cut tail surfaces. (2) Shaped balsa block. (3) Die-cut ribs. (4) Shaped trailing edge. (5) Sheet-covered leading edge. (6) Formed wire landing gear. (7) Tissue-covered wing 40" span. (8) Main fuselage structure with all formers, sides & bottoms assembled. (9) Spring steel skid.



Featuring a Redi-Built fuselage section, the Vampire has made its mark in Western circles



**DESIGN:  
VAMPIRE**

**MADE BY:  
F-B**

**CATEGORY:  
STUNT**

■ A really novel idea is the big feature of this stunt ship kit—the main section of the fuselage comes to you all cut out, glued together and sanded! This sort of “super-prefabrication” should be appreciated by beginner and expert alike.

The Redi-Built section comprises bottom, sides, and three bulkheads. These parts have been

glued up on a jig and are, of course, in absolutely true alignment. To complete the fuselage you need add only the rear turtle-deck, forward fuselage deck (cut to shape), and the nose details.

A product of F-B Model Aircraft, 3240 Larimer St., Denver, Colorado, the *Vampire* was designed by Bill Fox and Jerry Seracuse. It is a Class B-C plane of 360 sq. in. area and 40" span. The favored engine is any of the hot 29's, with a 10/6 prop. At lower altitudes a 9/6 prop would probably do as well, or even better. The finished plane should weigh about 32 oz. for top results.

The plans are quite small, but this is permissible since wing trailing edge is notched for the ribs, the fuselage is three-quarters completed when you get it, and the all-balsa tail surfaces are die-cut. Plenty of instructions and detail sketches are incorporated on the sheet.

The designers are especially proud of another assembly detail—the method of installing the landing gear. The preformed wire is held to the main bulkhead by

means of cotter pins pushed through ready-drilled holes. This bulkhead is of  $\frac{1}{4}$ " hard plywood and is one of those installed before you receive the kit.

The hardwood motor mounts slide through slots cut into the front bulkhead (pre-installed) which is also of hardwood. The motor may be left open, or semi-cowled, with the balsa blocks supplied.

The wing is a typical thick symmetrical stunt type, with a heavy tapered trailing edge, and leading edge formed of a  $\frac{7}{32}$ "x $\frac{1}{2}$ " spar plus  $\frac{1}{16}$ " planking top and bottom. The entire wing is planked for several inches on each side of the fuselage. The fuselage sides are pre-cut to allow installation of the finished wing. Tips are 1" wide blocks cut to airfoil cross-section.

As mentioned above, tail surfaces are all  $\frac{3}{16}$ " thick balsa, with elevators in two halves, hinged by fabric tape.

The finished ship is one of simple, pleasing lines. Extensive flight trials in competition have already netted the designers first places in quite a few Midwest meets.





**DESIGN:  
HOWARD IKE**

**MADE BY:  
MASTER MODELRAFT**

**CATEGORY:  
SCALE**

■ Our scale job this month is a very accurate copy of Ben Howard's sleek racer, reduced in size to take "large Half-A" engines, that is, those from .049 up to .09. A product of Master Modelcraft, 727 Westchester Ave., New York 55, N. Y., this is intended for the flyer who wants a ship fitting into the class of Half-A team racers. There is no such class officially, of course, but such events have been flown in many contests and are popular at impromptu club gatherings. If you want a fast plane that

fulfills the "realistic" specifications, Ike is your dish.

The finished plane will come out to 20" span, 15" length, and will weigh about 6 oz. less engine. For a real flying hot rod, put in a Cub 09 or McCoy 9 and watch her go! Designer Stan Lapin emphasizes that this is not a stunt job despite the symmetrical wing cross section; other than loops and wing-overs, better keep away from aerobatics. But for getting up and tearing around in level flight, this is the ship.

Prefab is extensive, of course. The fuselage comes in two halves, shaped outside and hollowed in. The lower half is beveled for the wing, and the bevel is given dihedral—when the two wing panels are cemented in place they will assume the correct angle, for the fuselage cut-out is shaped to produce this result.

Landing gear consists of two formed wire members, and the necessary drilled hardwood wheels. Also furnished are all parts needed to make wheel pants. The latter add a lot to appearance; however, they are naturally tricky to install, and the novice is well-advised to omit them. The pants are built up sandwich fashion, with 3/32" thick sides and a 1/4" center "filling." Plenty of scrap is left over from the die-cut sheets for landing gear fairings.

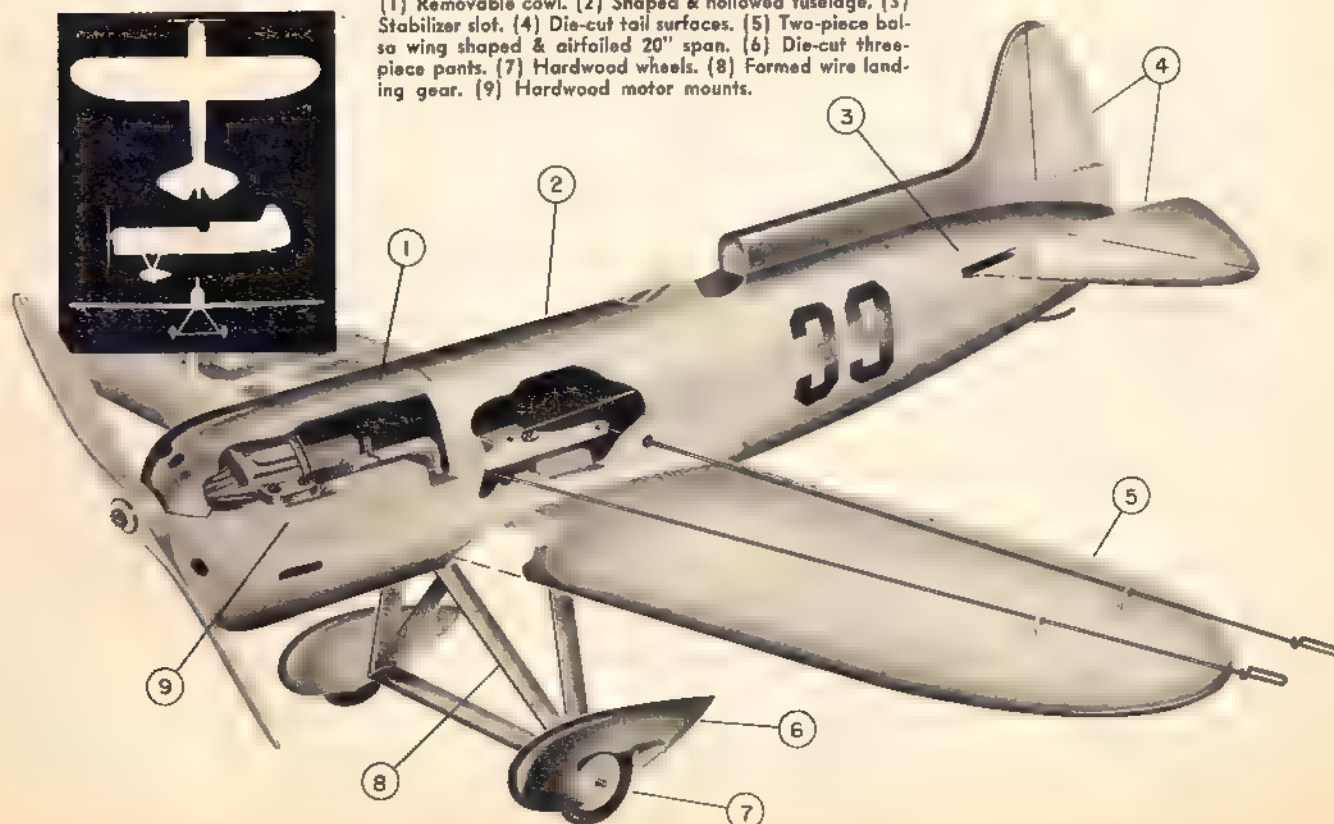
Three-ply hardwood strips are used as beam-style motor mounts, and a block of the same ply is included to hold bellcrank. The aluminum bellcrank is furnished, as are screws and washers to mount it, and to hold engine. Wing tip wire guides in the form of small copper lugs are to be cemented at designated positions, and another larger lug in the hardware envelope is for use as a control horn. Position, installation, and adjustment of all control system components are fully covered in drawings and instructions.

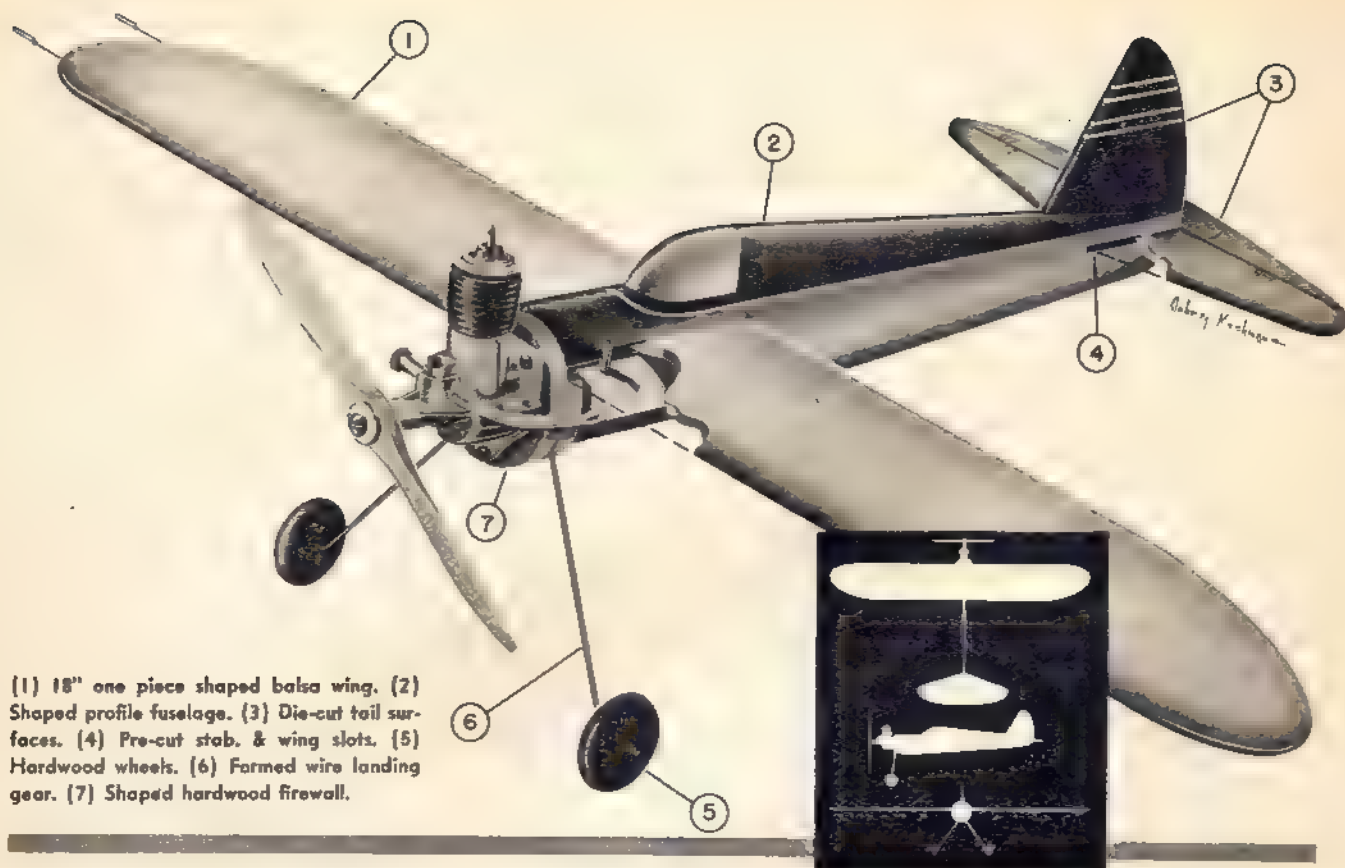
The two wing panels are shaped to final planform and airfoil section, but must be trimmed at tips and beveled at butt ends before assembly. Horizontal tail surfaces are in a sharply die-cut 1/16" sheet; the rudder is 3/32" stock. These parts are all of smooth well-finished balsa. The shaping job on the wing panels and the two fuselage halves is of high quality; surfaces require only light sanding before doping.

The cockpit for Ike's pilot is milled out, and celluloid for the windshield is in the kit. You also get a shaped headrest block, Flightex material for hinges and reinforcing wire for pushrod, etc.

The plan sheet has a single large phantom, or cutaway, view of the finished racer, plus many detail sketches. Instructions are complete.

- (1) Removable cowl. (2) Shaped & hollowed fuselage. (3) Stabilizer slot. (4) Die-cut tail surfaces. (5) Two-piece balsa wing shaped & airfoiled 20" span. (6) Die-cut three-piece pants. (7) Hardwood wheels. (8) Formed wire landing gear. (9) Hardwood motor mounts.





(1) 18" one piece shaped balsa wing. (2) Shaped profile fuselage. (3) Die-cut tail surfaces. (4) Pre-cut stab. & wing slots. (5) Hardwood wheels. (6) Formed wire landing gear. (7) Shaped hardwood firewall.

This perky little pursuit by Joy packs a big punch; Pee Wee Pup is simple, clean-cut



■ A line of well-thought-out Half-A control line kits has been marketed by Joy Products Co., Inc., Menominee, Mich. Aimed at the beginners, all three numbers of this "Simplikit" profile series are of the most elementary construction. There is even a saucy little biplane called the Stunt Runt, which, despite the fact it is a profile job, has very neat lines and lots of "novice appeal." The second

ship in the series, named Pee Wee Pursuit, is a 20" span midwing monoplane of a little more complexity—and slightly higher cost—than the Pee Wee Pup, our subject here.

The Pup is really noteworthy in that it appears to be the only nationally distributed control line kit job selling under \$1.00—you can take one home for only six bits. At this price one would rather expect an ultra-simple kit of somewhat shoddy materials. It's simple all right, but the materials are of top grade; you count only eight wood parts as you open the box. One of these, of course, is the die-cut sheet (and as sharply die-cut as you'll ever see!) of balsa containing all the tail group parts.

The fuselage is ready-cut to shape from a heavy grade of  $\frac{1}{8}$ " thick balsa. It is slotted for both wing and stab. There is a hardwood disk for motor mounting, which even has a circular groove cut in the forward face to enable easy installation of Baby Spit engines. With this style of mount, of course, the Spit tank must be removed; a separate tank is fastened under the wing for all en-

gines, except the K&B's with their bottom-mounted tanks. The plane has been flown with all size engines from .02 to .049, but the Infant is not recommended. Anything larger will do the job, though, and with an .049 this is a really lively Pup!

The wing is cut to outline shape and requires only a bit of sanding on the edges to ready it for doping. The flying surfaces are all of very clean, smooth  $\frac{3}{32}$ " thick balsa. The wing is cemented in the fuselage slot and is braced by two support blocks that back up the motor mount and also brace the landing gear.

The gear wire comes bent to shape, of course. Wheels are husky hardwood disks drilled to a good fit on the wire.

The plans are simple but entirely adequate; they include top and side views of the finished plane, an exploded assembly drawing, and step-by-step plans. Views of several different motor installations are given.

Specifications of the Pee Wee Pup are as follows: Span,  $17\frac{1}{2}$ ", fuselage length, 14", weight less engine, 2 oz., wing area, 50 sq. in.



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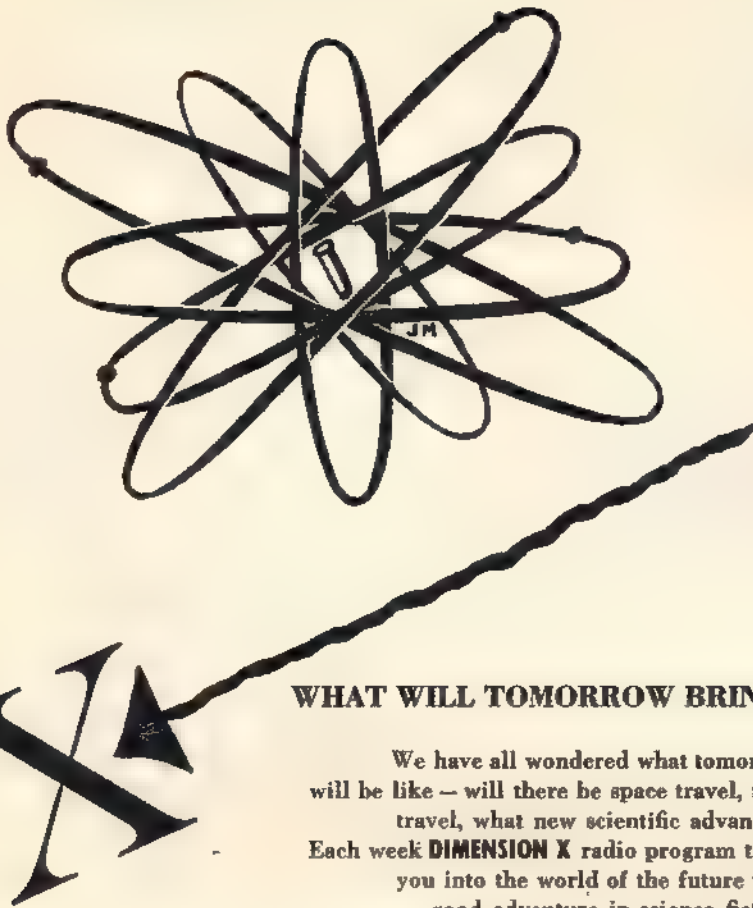
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## Wasp.049

DISPLACEMENT

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## Dummy Lifter

(Continued from page 41)

with very fine paper between each coat. Cabin looks weak, doesn't it? Well, have no fear, because the addition of sheet celluloid adds greater strength than is possible through the use of paper covering. Use pins or clip type clothespins to hold the celluloid in place while the cement dries.

Careful work on dethermalizer assembly will eliminate all difficulties which can occur. Mount two small brass grommets to bottom of stab as indicated. Cover these with cloth or silk reinforcement. Check their alignment with the hinge pins and correct if they vary too much. Note that hinge pins are not perfectly straight. They have a slight right-angle bend about  $\frac{1}{4}$ " from the tubing. This is put there so that the wire can pass around the thickness of tail platform and trailing edge. All the small rubber hooks can be made from straight pins if a shortage of wire exists.

A small hole is drilled into the  $\frac{1}{4}$ " rib in stab to take  $\frac{1}{16}$ " dowel mounted in the sub-rudder. This should produce a snug fit. Soft copper, or milk bottle wire, is used to make adjustment clips at front and rear of this rudder. The other rudder is permanently glued into position. After doing this add the small plywood tab at leading edge of stab. The purpose of this tab is to produce an air gap between the stab and the dethermalizer fuse.

Mount the engine and your favorite fuel cut-off and you are all set. Unless you want to add a little trim, you can go out to fly. Make sure you have at least four coats of fuel proofer on nose section of fuselage.

The original model balanced, loaded or empty, at exact point shown on the plan. This is directly in the center of the occupant compartment. Offset the rudder for a slight left turn and glide model over some tall grass. For first tests, leave occupant out. A slow steady glide will result. If the model shows extreme stall or glide characteristics, trim these out before trying a powered flight.

Don't be too critical, as all models glide differently when they get into the air. Use wide-open power for first flight and a motor run of about five seconds. Poor power characteristics become just as apparent when using short motor runs, and prove to be less disastrous.

The model has an inherent turn to the right with neutral settings. For this reason you should use left rudder until a shallow right climb occurs. The glide will be fairly tight to left if this process is used. When satisfied with the performance, you should add the occupant and fly on your original settings. The only difference in flight is an increase in gliding speed which will prove much to your advantage on a windy day.



"What's the date today?"



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Wing Span ... 47 in. Weight ... approx. 26 oz.  
Wing area ... 470 sq. in. Speed ... 60 to 75 M.P.H.  
Length ... 30 1/2 in. Engine ... .33 to .35 dia.

Here is the sensational performance record—SENIOR STUNT EVENT won by Buzz Ferguson with 590 1/2 points. OPEN STUNT EVENT won by Lou Andrews with 418 points. Lou won the National Stunt Championship (for highest score) and with it the coveted Jim Walker Trophy.



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PINE  
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MODELS

DESIGNED BY LOU ANDREWS

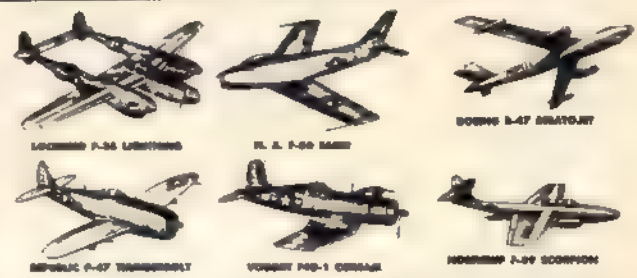


Wing Span ... 20 1/2 in.  
Wing Area ... 118 sq. in.  
Length ... 18 1/2 in.  
Weight ... approx. 4 1/2 oz.  
Engine ... .033 to .040 dia.

\$2.95

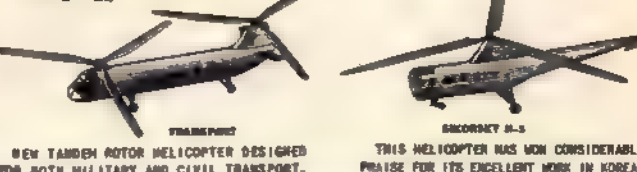
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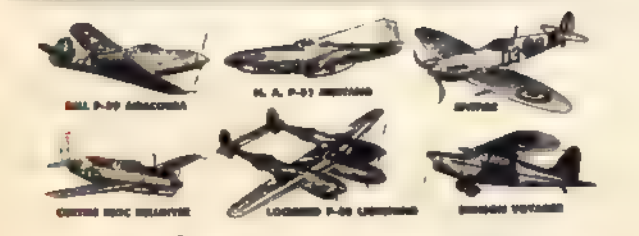
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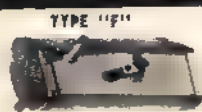
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Best free flight of British contest season was "Jaded Maid". This one by H. A. C. Savage, Croydon, is powered by Elfin diesel.

## Dope Can

News, Views, Comments and Photos from Model Clubs and Enthusiasts in U. S. and Overseas

■ Europe retained the Wakefield Cup for the third year running when Sune Stark of Sweden took top honors in the hotly contested event held on July 6 and 7 at Jami-Jarvi, Finland. Great Britain came in second and Italy third. Austin Hofmeister of Baltimore was the highest American flyer with his 5th place. Manuel Andrade of Oakland was 7th. A full team of 6 U. S. flyers participated through the generosity of Jim (AJ Aircraft) Walker, who provided the overseas airline trips, and other individuals and firms who helped underwrite additional expenses.

According to genial George Perryman, captain of the U. S. team, the top-place standings were as follows:

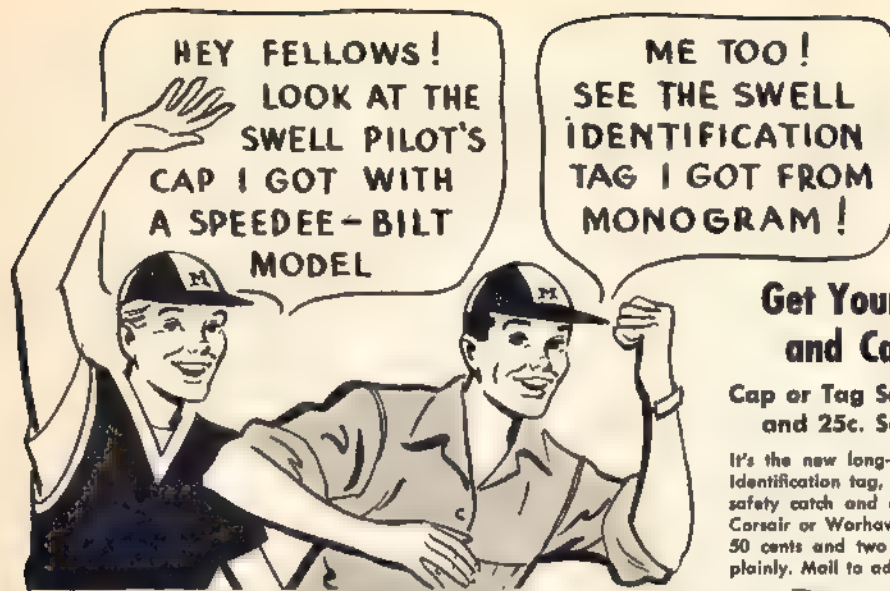
Place	Name	Country	Flights (in seconds)			
			1st	2nd	3rd	Total
1	Sune Stark	Sweden	226.2	232.5	248.5	705.2
2	H. Tubbs	England	252.7	238.9	188.6	679.2
3	S. Lostrati	Italy	225.9	220.1	209.1	655.1
4	J. de Jong	Holland	258.1	206.0	189.8	653.9
5	A. Hofmeister	U. S. A.	201.9	223.8	204.8	629.4
6	C. R. de Vries	Holland	194.8	170.3	256.5	621.6
7	M. Andrade	U. S. A.	228.0	180.5	208.3	616.8
8	P. Descheppe	Belgium	202.2	243.4	184.0	629.6
9	F. Holland	England	221.2	190.0	187.4	598.6
10	F. Casola	Italy	172.0	236.0	190.2	598.2

The three rounds of the meet were flown at different times. On two successive evenings rounds were run off from 8 to 11 p.m. The last evening flying was followed by the final session at 3 a.m. For the most part it was windy with frequent wind shifts with entries being blown toward and over a hill. Fast-climbing models were at a disadvantage. Visibility was reported poor for the most part and downdrafts over the surrounding ridges did not contribute to duration.

Computed on a basis of total duration in seconds racked up by each team member, the British lads made the best showing. Total team times were as follows:

(Continued on page 58)

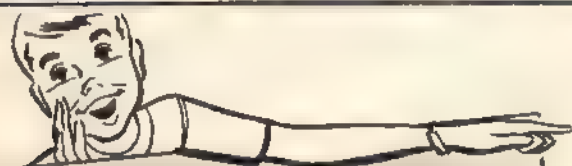




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We told you last month how thrilled we were with our three new SPEEDEE-BILT MODELS—the models so many of you asked for. We know you are thrilled with them too, fellows, and that never before have you seen such fine kits and such big values.

And when you get to building them—Oh Boy! Such fun! Such realism! The three and four-bladed plastic props and other plastic parts added to the other outstanding SPEEDEE-BILT features, make building so easy and make you so proud of your finished models.

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**NEW**  
Kit G-13

### Swept-Back Wings • Deadly Fire Power

All These Parts in This Kit—Plastic Cowling—Plastic Pilot—Plastic Rockets (4)—Plastic Exhaust—Famous Monofoil Wing (Right and Left)—Prefabricated Fuselage and Tail Parts, in

Full Color and Die Cut—Plastic Canopy (Detail Molded)—3-Color Decals—Rubber Wheels—Metal Landing Gear, (Specially Formed)—Detail Picture Plans and 9 other parts.



**NEW**  
Kit G-14

### Gull Wings Easy to Build • More Simplified Construction

Corsair Parts List—Four-Bladed Plastic Prop—Plastic Cannon—Plastic Pilot—Plastic Cowling—Prefabricated Fuselage and Tail Parts, in Full Color and Precision Die Cut—Monofoil Wings (Right, Left and Center Sec-

tions)—Three-Color Genuine Decals—Rubber Wheels—Landing Gear (Specially Formed)—Plastic Canopy (Detail Molded)—Rubber Loop—Detail Picture Plan and 11 other parts.



**NEW**  
Kit G-15

### The All-Time Favorite • Ferocious Tiger Mouth Decals

Build With These Parts—Three-Bladed Plastic Prop with Plastic Spinner—Plastic Pilot—Plastic Exhausts—Plastic Cowling—Prefabricated Fuselage and Tail Parts, in Full Color and Precision Die Cut—Monofoil Wing (Left

and Right)—Formed Plastic Canopy—Rubber Wheels—Complete Landing Gear—Three-Color Genuine Decals—Rubber Loop—Detail Picture Plans and 12 other parts.

**MONOGRAM MODELS, INC • 225 N. RACINE AVE. • CHICAGO 7**

(Continued from page 54)

lows (figure in parenthesis denotes the number of men on the team): England (6), 2,934.9; U. S. A. (6), 2,904.6; Italy (6), 2,637.5; Holland (5), 2,607.0; Belgium (4), 1,923.9; Sweden (4), 1,762.4; Australia (5), 1,338.2; Finland (6), 1,333.4; France (3), 1,027.9; Canada (3), 547.0; South Africa (2), 300.5.

The models from Australia, Canada and South Africa were flown by proxy modelers. One of the South African proxy flyers was from South Africa—and even more surprising was the fact that he'd hitchhiked to Finland from his native land. He started at Easter and just made it with a few days to spare. This ardent modeler would work a few days at each port of call to pay for lodging and passage when necessary.

Winner in 1949 and 1950, Aarne Ellila of Finland, ran into tough luck and placed 47th in a field of 51 entries. With England making the top team showing, many observers look for a change in Wakefield rules whereby a team will compete for the trophy instead of an individual. The English through their S.M.A.E. write the Wakefield rules.

According to all reports the Dutch flyers were the most relaxed contestants. The Americans had the most unusual designs. The Swedes indicated they'd run the contest off in 1952 pretty much as it has been handled in Finland—flights to be made during the long summer evenings.

By virtue of the fact that Pan American World Airways and the KLM airline put the American team members up overnight on several occasions, the U. S. representatives flew and lived mighty high and had a fine time.

Before the Americans departed from New York by a PanAm Clipper plane, William (Berkeley Bill) Effinger, Jr., tendered the team a luncheon in the NYC Wings Club. At that affair some interesting statistics were brought forth. On the average, American team members had been building models for almost 16½ years! Yet the average age was less than 30—27 years, 8 months to be exact. So it looks as if some really experienced men flew on that team for us. A remarkable fact was that none had ever qualified for a previous Wakefield team.

Here's a quick run-down on the 1951



J. B. Oberthier of Plainview, Texas, with his Sammy Mason PT. Has Anderson Spitfire 65, silk covered, Aero Gloss finish. Neat!



The six members of the U. S. Wakefield team. From left: Austin Hofmeister, Baltimore; Dave Kneeland, Hickman Mills, Mo.; George Perryman, West Point, Ga. (captain); Joseph Foster, San Jose, Cal.; Manuel Andrade, Oakland, Cal.; Joseph Elgin, Cleveland, O.; Mrs. Elgin.

team members: Joe Elgin, 31, of Cleveland, who placed 12th in the finals, is a lithographer and a free lance flyer not currently associated with any model club. Joe served with the 8th Air Force in England during the last war when he was a navigator on a B-17. Mrs. Elgin accompanied hubby on the trip and they set off on a tour of the British Isles after the Finland affair.

David Kneeland of Hickman Mills, Mo., is a member of the Winged Motors Club of Kansas City. He placed 39th in Finland. Dave is 27 and a draftsman-engineer for the Mid-West Research Institute. He was in Navy engineering during World War II and has been building models for 20 years. Dave is a keen exponent of a six-minute maximum flight time limit for all types of model flying. After six minutes, he contends, there is no element of skill remaining in a flight—only luck. Forget the thermal factor beyond 6 minutes and free more stop watches for other flyers, is his argument. As did all team members for their respective semi-final CD's, Kneeland had high praise for Jim Stewart of Grand Prairie, Tex., the one who conducted the qualifying round in which Dave captured a place on the team.

Austin Hofmeister, Baltimore, is 29 and served with the infantry during the last war. He's been building models for the past 18 years and operates as a free lance flyer. Austin, who placed highest of the American flyers, is in sales work.

Well known for his polyhedral stab designs is George Perryman of West Point, Ga. George is a draftsman for a concern which turns out textile machines. An ex-G.I., he served with the Air Force as crew chief on a B-29. Perryman flies as a member of the Valley Model Aero Club and has been active in modeling for the past 15 years. He placed 15th in the finals.

Joe Foster, Jr., San Jose, Calif., was the youngest member of the team at 24. He is a photographer by trade and was a cadet pilot with the Air Force. Joe has been making models for 14

years. He was 29th at Jami-Jarvi.

The remaining member of the '51 U. S. team was Manuel Andrade, Oakland. Like Joe, Manuel is a member of the Oakland Cloud Dusters and their double victory in making the team certainly must have set some of the Southern California Wakefield contenders back on their heels. Andrade is 29, has been flying modelplanes for the past 15 years, is currently an aircraft mechanic at the Alameda Naval Air Station. During the last war he served in the Air Force as a maintenance man with a night fighter group.

All the team members were loud in their praise of the hard efforts expended by the directors of the regional and qualifying American meets. One had the distinct feeling that their expressions of sincere appreciation would have been just as vehement even if they had not captured team trips. To Jim Walker, of course, goes the gratitude of every American enthusiast for making the participation of a full U. S. team "in person" possible. Jim, a manufacturer of millions of rubber-powered all-balsa stick-type flying models, has started countless thousands of youngsters on the modelplane building path. He made a significant contribution to the advancement of American modeling and international good-will with his gift of six round trips by air to Finland for the U. S. team.

A special bouquet is due Ed Lidgard, chairman of the AMA's Wakefield Committee, along with his associates, Russ Johnson of California and William Fletcher of N. Y. C.

**How to Settle a Tie.** Wakefielder George Perryman passed on some interesting advice to contest directors faced with the problem of settling a tie in a modelplane contest. Seems as if there were two rather beefy flyers who ended up in a dead heat in a Georgia free flight meet. Both had racked up equal times, duplicate prizes were just not available, they'd be darned if they'd toss a coin to decide who'd get the 1st place trophy.

(Continued on page 64)









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"CHAMPION 36"

"SHADOW"

"TOWLINE TERROR"

## Plane Talk

(Continued from page 8)

remain, the cannon just begin again.

What can be done in future, not only for bloodless victories in war but for directions in civil defense or other emergencies, can only be guessed.

### TICKETS TO LIFE

As for the leaflets, the Chinese have regarded them as safe-conduct passes and have surrendered, grinning and waving these colored prints with pictures and Chinese characters. Not only that, but some prisoners bring a whole set of tickets. If they get one showing medical treatment, another for food, and one for cigarettes, they believe they will get all these things—as they do.

As the result of the interrogation of plenty of prisoners, there is no doubt about the effectiveness of the method which might work even better for a more literate foe. It may well be seen how Syke Air, bloodless and inexpensive, has paid in the capture of 60,000 or more. Cities also have been targets of this operation, to encourage sabotage and non-cooperation with the enemy.

To train Psychological Warfare Officers and Foreign Language Propaganda Officers, the Air Force has conducted a special school at Georgetown University in Washington. Subjects taught have included comparative cultures, foreign policy, sociology, and economic factors. Now a new Wing has been established at Mountain Home Air Force Base in Idaho. Part of its mission is aerial resupply and communi-

cations, but the main job is Syke Air, "to reproduce and disseminate psychological warfare materials," as the official words go.

For the future, many more uses come to mind. Since the Reds jam the Voice of America broadcasts, and few own receivers anyhow, there is still the leaflet from the air for bloodless victories on a far greater scale. Though the paper balloons that the Japanese sent against us were mostly lost at sea, Drew Pearson has pointed out that the westerly winds from Europe could easily spread messages, from the free world behind the Iron Curtain.

In a shooting war, not only planes but missiles are conceivable for delivery of the good word for our side. Aviation, after its destructive interlude, may at last become the instrument of peace that its pioneers envisioned.

KENDALL K. HOYT

## Whizz Wagons

(Continued from page 46)

and a lock. Sandwich the bellerank between the head of the bolt and a nut so that it will have smooth action without wobbling. Force the bolt through the hole and tighten the top nut until the washers are almost level with the wing surface. Coat brass sheet and lower nut and washer with cement to lock the assembly. The wing can now be cemented to the top shell.

The elevator horn is made from wire. It runs to the tip and is then bent back to obtain firm anchorage. Loop wire to hold operating wire, which can be made from .049 gauge. Cement hinges as shown. Then cement the stabilizer to

the lower shell, as shown on plan.

When carving the cowlings, be careful not to break it in half because of the exhaust slots. Might be a good idea to cut slots to halfway point from top down. Then cement the top in place. With top in place, the slots can be completed. Cement cowlings in place while the two shells are bolted together. If you are worried about scorching the wood by the hot motor, coat the interior with water glass.

Note the use of 1/16" plywood for the nose on the top shell to prevent balsa chipping. Do likewise on bottom if balsa shell is used. Notice the construction of the wire guides. Push "U" wire through wing and press into balsa until flush with surface. Bend loops and cement well. The Wasp engine needs an extension for the needle valve stem.

The model can now be assembled and finished. It is a good idea to coat the fuselage inside with several layers of clear dope to obtain hard surface. The strongest finish is still more coats of 50-50 dope-and-cement mixture. By applying this, a celluloid-like skin is obtained. This should be rubbed down very smooth. A final coat of fuel proof-er completes the model.

If color is desired, take the dope and mix in it enough talcum powder to obtain a thin paste. Coat the model and sand when dry. This will fill whatever cracks may still be present. Then apply several thin coats with regular finishing procedure. Be sure to let dope dry completely before adding more. It is best to use thin coats to preserve as much base toughness as possible. Pigment in the dope weakens it and it may also soften the cement-skin base if you tend to work too fast.



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# Q and A

QUESTIONS ON ALL PHASES OF AVIATION AND MODELING WITH ANSWERS SUPPLIED BY AIR TRAILS' BOARD OF EXPERTS

**Tigercat Afloat** . . . Did the Grumman twin-engine Tigercat ever go into service on carriers?

Randy MacIntosh, Bremerton, Wash.

• The F7F Tigercat was primarily used as a land-based Marine fighter, but it has operated successfully from aircraft carriers of the Essex class.

**Specifications** . . . Would you tell me the wingspan of Grumman Panther Navy jet fighter, the Republic Thunderjet, and the Vought F7U Cutlass? Also the fuselage length of the Lockheed P-80.

John W. Kalusa, Chicago, Ill.

• Wingspan of the Grumman Panther: 38 ft.; Republic Thunderjet: 37 ft.; Chance Vought F7U: 39 ft. Fuselage length of the Lockheed P-80 is 34 ft. 6 in.

Please tell me the wingspan, length, altitude and how many men in the crew of the B-17 Flying Fortress. Also the range and altitude of the Bell P-39 Airacobra.

Richard Moore, Chicago, Ill.

• The B-17 had a wingspan of 103 ft. 9 in., length of 74 ft. 9 in. Normal crew complement was nine men; service ceiling around 30,000 ft.

The Bell P-39 had a range of 1,100 mi. with belly tank at a speed of 178 mph, which was its economical cruising speed. Service ceiling was reported to be around 30,000 ft., which is rather doubtful since pilots who flew it reported having a hard time climbing to an altitude higher than 15,000 ft.

**The Primary Glider Question** . . . Would you please send address or information where plans for a primary training glider are obtained, one that has a 20 or 25 ft. wingspan and will accommodate one person?

Which is best, pod and boom or fuselage type of glider? We are two boys of 16 and would like to try our hand at such a thing. We have been building models for the past four years and find it very interesting. We belong to the local modelplane club here in town.

Fred Jones and Glenn Morris, Moose Jaw, Sask., Can.

• Sorry, no such plans are available in this country. The primary glider should have a wingspan of not less than 34 ft. As to pod and boom vs. fuselage type, a well-designed pod and boom glider will have slightly less drag, but the boom usually presents problems in connection with the strength of tail anchorage.

**Difference in Ardens** . . . I like to know what is the difference between Special Arden engine and the Standard Arden engine? It has been bothering me.

Guy Hoffmann, Lima, Peru

• Two Arden engines have been put on the market; one is fitted with a bronze bushing for the main bearing and the other has two ball bearings.

**When Wings Warp** . . . Not long ago I built a rubber-powered Hellcat. Now the wings are warped and have a much larger dihedral. The covering has lines in it like grain in wood. What causes this and what may I do to prevent it?

Fred Balchunas, Vancouver, B.C., Can.

• You can prevent such warpage on future models by adding a few drops of castor oil to your dope. Three drops per ounce of dope is about right, but try some out before applying it to your model. If it is sticky after drying, cut down the amount of oil.

There is probably nothing you can do to the Hellcat except recover it. Warps can sometimes be removed by holding the wing over a steaming teakettle and twisting opposite to the warp. Hold this away after removing from the steam, until the paper becomes dry and taut again.

(Continued on page 63)



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Cl. AA Open  
Dick Everett  
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Perf: 22:05, Torp .049  
6/3 Top Flite

Cl. AA Senior  
Jack McComb  
Columbia, Mo.  
Perf: 15:07.6, Wasp .049  
6/4 Top Flite

Cl. B Open  
Ernie Shailer  
Detroit, Mich.  
Perf: 21:41.4, Forster 29  
10/3 1/2 Top Flite

Cl. C Junior  
Curtis Franke  
San Antonio, Texas  
Perf: 18:43, Torp 32  
11/6 Top Flite

Class C Senior  
Don Murray  
West Point, Ga.  
Perf: 22:00, Triumph 49  
11/6 Top Flite

Cl. C Open  
Bob Ottoman  
Medford, Oregon  
Perf: 20:05.4, Torp 32  
10/6 Top Flite

Row Junior  
Bill Lofland  
Abilene, Texas  
Perf: 4-11 8, Veco 29  
9 1/2/6 Power Prop

Row Senior  
Edward R. Male  
Chicago, Ill.  
Perf: 11:27, OK Cub 09  
7/4 Top Flite

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253 pts., Fox 35  
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## PAA LOAD Class AB

Junior  
Michael Cook  
Glendale, Ohio  
Perf: 3 36.6,  
Ohlsson 29  
11/4 Top Flite

Open  
Herb Kotze  
Grand Prairie, Texas  
Perf: 15:19, Torp 29  
11/4 Top Flite

Flying Scale  
Senior  
Juel Clevenger  
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Altwood 49  
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324 pts., Veco 29  
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Precision Acrobatic  
Open  
Luis J. Andrews  
Norwood, Mass.  
382 pts., Fox 35  
10/6 Top Flite

Flying Scale  
Open  
Chief John K. Abbott  
Corpus Christi, Texas  
McCoy 49  
10/6 Top Flite

Team Racing  
Open  
Bob Lutker  
Fort Worth, Texas  
454 pts., K & B 29  
9/9 Power Prop

Flying Scale  
Junior  
Jimmy McRoskey  
Irrel, Texas  
KNB 32  
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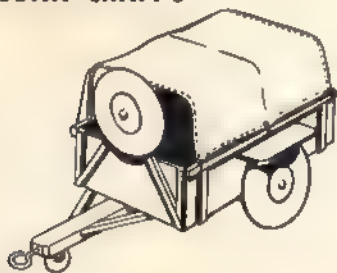
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## Western R-C



"Certainly it flies," says "Skipper" Willson. The ship is a six-foot Scientific Mercury with a K&B Torpedo .29 controlled by Citizen's Band rcvr. Built by Colby Evett; red and yellow.

Leading the country in R-C work  
are the West Coast modelers who  
fly their craft the year 'round.

Inglewood, Calif.'s J. A. Acker was on hand with camera recently when some of the noted Western radio controllers flew their models. Most of these R-C enthusiasts are ex-free fighters who have found control from the ground the answer to their retrieving problems. More all-radio clubs are in West than elsewhere.



Dick Schumacher launches an R-C model which is operated on 27 mc band opened to AMA for test purposes. A Ruddervator is used for control and Cub .074 pulls ship nicely. Roy Mayes spectates.



Bill (W6JX) Butler's models range from Rockwood controlled (tuned read) Rudder Bug to modified Jasco Floater with .099 Arden and Aero-trol rcvr. Ruddervator jobs are original.



**Car Gas for Glow Plugs?** . . . I have heard that model airplane engines could be run on white gas actually made for cars. Would this be advisable for a McCoy .098 and a Spitzzy .045? Would a lubricant need be added?

Barry Hallem, Carteret, N. J.

• Prior to 1947 all model airplane engines ran on gasoline and oil. This required a spark coil and batteries, similar to those used on automobiles to explode the mixture. Glow plug engines have been introduced to eliminate the complication and extra weight of spark ignition systems. A small engine such as your McCoy .098 and Spitzzy .045 do not have enough power to pull the extra weight of batteries and spark coil. Also, they are not fitted with points or a timer assembly. In spite of the extra cost of the fuel, glow plug operation is more satisfactory.

**Wheels for a Wildcat** . . . I am building a Grumman F7F Wildcat and can't find wheels to fit it. Could you please tell me where I can get two wheels 3" in diam. and one wheel 2" in diam.? It is preferred that they look alike, of course. Also, tell me where I can get two 3-bladed propellers to fit two O&R 23s.

Robert Lee Baker, Seymour, Ind.

• Mail order suppliers such as Berkeley, Jasco, Veco, Crescent could probably supply you with 2" and 3" dia. wheels. See ads in Air Trails. X-Cell Speed are 3-bladed props, now out of manufacture. You may find odd items in some hobby shops.

**Large Tank for a Spitzzy** . . . Is there any danger in putting an excess tank on a Spitzzy (.045) without burning it up? It will run about 1 min. on its interval tank and I'd like for it to run a little longer. Would it burn out or shorten the life of the motor?

Henley McElveen, Lake City, S. C.

• Many modelers use large tanks on your type of .045 engines. Flights up to five minutes can be made without any damage to the engine. The increased running time naturally wears the engine more than a short flight, but the total number of hours of useful flight time is not changed to any great extent. With a five-minute tank you should be able to get six months or more use from your Spitzzy engine.

**License-Free Band** . . . I understand that a license-free band has just been opened up on 485 mc. Is this true? Does operating a transmitter on this band require a factory-made transmitter?

Could you advise me as to where I could obtain plans for equipment that would operate on any one of the license-free bands?

Dave Hunt, Chagrin Falls, Ohio

• The only "license-free band" in this country is 485 mc. The transmitter has to be registered on a form sent to FCC, but there is no charge and no examination.

No plans have been published for such equipment, since it is illegal to build and operate your own. You can, of course, make your own receivers for the Citizens Band. There is only one make of transmitter (MacNabb) approved for use on 485 mc.

**One Engine Only** . . . I would like to build a P-38 but use only one engine (O&R 23) and I would like to have information on which side to put the engine, right or left. Have heard many arguments to both sides and would like to know the facts.

William Reynolds, Farnfeldt, Mo.

• Flying a twin-engined model on one engine can be tricky if the model is not balanced properly or if the engine is not powerful enough for the size and weight of the model. However, twin-engined models can and have been flown this way.

If you do build such a ship, mount your engine on the side of the model toward inside of the circle. The drag of the other nacelle will then be acting outside of the thrust line and will cause the model to tend to turn outward, making for good control conditions.

If you use two engines (glow plug) always make the tank for the outside engine slightly smaller. In this way you can assure yourself of the outside engine cutting first, allowing the model good control while landing.

Some builders prefer to rig cut-offs for both engines similar to those used for team racing that will cut both engines together.

If ignition is used a third line or relay can close a switch on both engine circuits so that they close together.

If you plan to build a P-38 model using an O&R 23 for power, we would advise that about 30" span would be about tops. Weight would have to be kept to between 1½ lb. and 2 lb. to give good performance with that amount of power.

# 8 New Stars On The Cleveland Pennant!

## "SIMPLEX" KITS

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**"QUICKY" SETS BUILD FASTER, LOOK MORE REAL, AND FLY BETTER THAN ANY SIMILAR MODELS!**  
No cutting, no covering, no painting! — Just assemble and fly! Believe it or not, it can be done in just 18½ minutes! The parts are colorfully decorated in realistic detail just as they come. A one-piece completely finished, 18" wing, and a big, indestructible plastic prop, plus the lightness and ruggedness that result from their ultra-simplicity all go to make them tops. They are engineered to fly several hundred feet! Way 'em all, build 'em all, and fly 'em tonight — you'll have the time of your life!

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**BUILD THESE, AND BE PROUD OF THEM!**  
• Almost one sq. ft. of decals in P-26A! • Shaped, notched leading edges • Tapered, notched trailing edges • Preformed wire • EVERYTHING discut! • Giant cow! turning (P-26-A) • Preshaped wing struts • Easy-interlocking bulkheads and keel construction (or notched sheet sides) • Roated-out wheel shoes • Brilliant, colored "Skyenail" gas model tissue • Tails are discut sheet • Handy Bulkhead notcher in ea. kit • Stunt and sport rib

WHEN ORDERING BY MAIL: (If your dealer is out of stock) Do not accept substitutes for C-D's but order direct. Orders under \$1. not accepted. (No C.O.D.'s.) Include 35c pack-post. to all orders up to \$3.50, over \$3.50 add 10%. (This includes A.P.O. and U.S. Possess.) Foreign customers add 10% for special handling, etc., in addition to pack-post. charges. Special Delivery in U.S.A. only, 35c extra. Ohio residents, add 3% Sales Tax. Send 3c stamp for illustrated airplane circular

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Every part completely  
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## Dope Can

(Continued from page 56)

Finally, much to the relief of the CD, one of the tie-ers came up with the solution. They'd run a foot race, by golly, and the fastest man would be declared free flight champ of that contest. So a 100-yard course was marked off, the hefty modelers lined up on the starting line, somebody blew a whistle and off went the flyers lumbering down the course. Both made it eventually, both were satisfied with the method of breaking the tie. Says George, "Best way of settling a ticklish situation I ever saw."

**Chicagoand Modeling.** The Chicago Tribune has announced the formation of a modelplane flying and building department which will be dedicated to fostering and supporting modelplane flyers (quoting from the Trib) with the intention of re-establishing Chicago as the national center for the activity. The Tribune expects to assist modelplane clubs in conducting flying meets, in obtaining supervised flying grounds and in getting novice flyers interested.

This is good news indeed for the modelers in the 5-state area served by the largest of the Chicago newspapers. The Tribune swings a lot of weight in and around Chicago and should be able to do much in the way of securing model flying fields. Clubs in the area who wish to participate in Tribune-sponsored activities are requested to contact Arnold Waldersen of the Suburban Fliers, 7405 W Madison St., Chicago.

In announcing its entrance into the modelplane field, the paper stated, the Tribune's revived interest in model flying stems from the value in aviation technical training which automatically is accumulated by participants—whatever their ages—and from the funneling of youth interest in particular to a fas-

cinating and healthful sport which has overtones of national defense. Air Force, Navy and American Legion support for model flying throughout the country, as well as in Chicago, has indicated the latter phases of the program.

"Initially the Tribune is planning no big flying competition. Instead the paper will attempt to assist in formation of many new clubs and building up existing clubs in this area. The intent is to help provide sponsoring adult organizations for the flyers and aid in setting up workshops where inexperienced boys and girls can get advice, assistance and leadership in what is a challenging and complex science.

"The Tribune expects to help the model builders association to run a series of inter-club competitions this fall. If interest in the sport is generated as anticipated the same association will progress to inter-sectional and eventually into area competitions."

**Ladies Day.** Chicago and New York recently recognized the important place the gals play in the modeling picture. The New York Herald-Tribune devoted more than half a column to "Women Find Model Planes Pleasant Hobby—Bronx Housewife Tells of Crowds That Turn Out to See Neighborhood Flight." This was an interview with Mrs. Blanche Hasselbach, wife of the well-known Hell-Razor Art, big chief of Consolidated Models and director of control line events for this year's Mirror Model Flying Fair.

Betty Walker's for-the-girls-only column in the Chicago Sun-Times had an interesting interview with 20-year-old Theresa Grish, who was described as a 5-foot, 2-inch, 112-pound test pilot in her brothers' modelplane factory at St. John, Ind. Contestants at recent National and Plymouth International meets need no introduction to the very pretty Theresa. She confided to Miss Walker that she took up modelplane flying three years ago when her brothers, who are



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25¢ • 50¢ • \$1.00

## STRUCT-O-SPEED E-Z-to-Build Flying Models

**MOST COMPLETE 50¢ KIT ON MARKET!**

**50¢**

### THE "K" LINE

3 models at dealers—more coming! Plastic cowling and prop, balsa Holt-O-Wing! Completely pre-fab, with die-cut, color-printed balsa sheets.



K1-AERONCA

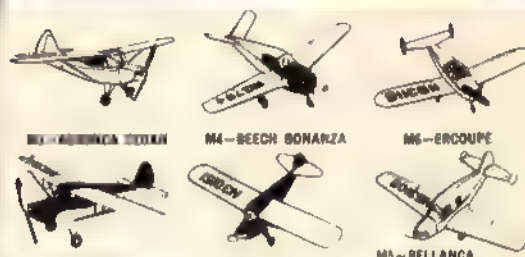
K2-PIPER CUB

K3-TAYLORCRAFT

**\$1.00**

### THE "M" LINE

6 rubber-powered models; suitable for 1/2A engines. Plastic parts, shock-absorbing landing gear, shaped wing!



M2-PIPER CUB

M1-TAYLORCRAFT

M5-BELLANCA

129 W. 29th ST., CHICAGO 16, ILL.

in the model prop making business, decided they were too old to continue participating in model contests.

A striking blonde, Miss Grish not only can handle a speed model with the best of 'em, but is capable of running every machine in her brothers' manufacturing plant.

**Western Open.** The 6th All-American Open meet will be held Oct. 13 and 14 at the Los Angeles International Airport under the sponsorship of the L.A. Junior Chamber of Commerce. This year's meet is expected to be largest of its kind on the Coast, according to Chairman Bill Gimbell. It will be held in conjunction with the annual Air Transportation Day celebration at the airport.

Competition will include indoor rubber, stick and cabin combined; indoor hand-launched gliders; all classes of speed control line combined; jet U-control; control line aerobatics, all classes combined; outdoor hand-launched gliders, outdoor towline gliders; all classes of free flight combined into one event; outdoor rubber, stick and cabin combined.

Entry blanks and rules from the L.A.J.C. of C., 1151 S. Broadway, L.A., 15

**Beaumont Reporting.** The Sabine Area Gas Model Aeroplane Club (2170 Pecos, Beaumont, Texas) is a very active group. "In fact," says president E. D. Patterson, "we believe it to be the largest active club in the Southwest." And little wonder—the organization has more than 100 members with 85 active all the time. Sponsored by the Exchange Club of Beaumont, the modelers are fortunate in having one of the finest flying fields in their part of the country. The city has recently completed a new 60-acre Central Park which is available to anyone interested in model aviation. Three 150-foot flying circles, each having a 10-foot concreted pivot circle with a re-

movable pylon post, are a permanent part of the park. The circles are lighted for night flying. Now that's what we really call living, brother!

**Model Firms at Work.** During any defense or war periods the concerns manufacturing modelplane materials always make a significant contribution. But we seldom learn much about what they do until it's all over. So it's good to hear that one company, Henry Engineering Co., manufacturers of Veco products, announces what's cooking. Henry has just completed a series of scale models of the famous Douglas Globemaster load-lifting giants. Contracted by Douglas Aircraft Co., for use in loading studies and in instructing on transportation of military equipment in war colleges, the precise scale models feature transparent side and nose pieces, hinge mounted, so that scale model equipment may be loaded aboard the ship.

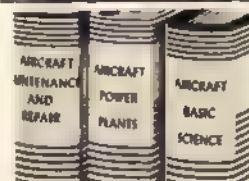
This, the first of a series of technical projects under way in the defense program, is a natural outgrowth of scale and prototype flight model manufacturing for the model and hobby field. Henry continues to produce prefabricated kits and a number of accessories for the modelplane industry.

**Comments and Staff.** Lawrence H. Conover of the Illinois Iowa Aeronautical Association (Iowa City, Iowa, branch): "Many members of the IIAA would like to see a paper-covered event replacing just one indoor event at the Nationals. They would give many modelers a start toward the art of microfilm."

Andrew E. Emery, Mexico City, Mexico: "I don't know if we'll ever get under way on it, but another ex-G.I. down here and myself have been making plans to fly a model non-stop from Mexico City to the U. S. border. Maybe it's just a pipe dream at the moment, but we have great hopes. Probably use

(Continued on page 69)

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## CURTISS P40F GAS MODEL

New Improved Model



48" Span. Free flight or U Control

Improved with new 2 1/2" alum. spinner and 3" Vaco alum. disk semi-pneumatic rubber wheels. Planked type body parts printed on balsa, and all \$9.00 parts. Set

## REPUBLIC P47D GAS MODEL



55 1/2" span, 3/4" scale Length 30 1/2" One-piece moulded clear plexiglas cockpit enclosure. 2 1/2" scale alum. disk rubber wheels. Body planking full size plans Uses B or C motor \$5.95 Set

## 9' TAYLOR CRAFT GAS MODEL



9' 1/2" Span. Can use Radio control. Set has 36 ready cut wing ribs, cut plywood body formers, 16" curved prop, tail wheel unit, 1 full size plane, printed balsa filkspan, etc Uses "C" type motor single twin or 4 cyl motor Set without \$17.50 motor or wheels, postpaid Extra pair of 4 1/2" airwheels \$4.50

## CURTISS HAWK F11C4



32 1/2" span. Length 22 1/2" 1" Scale. A real collector's item. Finely detailed. Set has air wheels ready cut parts, turned balsa cowl unit parts \$4.50 printed on balsa. Const. set

## Stearman PT17 N. American B-25



Set has 2 1/2" creamfield motor plastic prop etc 28" span. Const. set \$2.95



24 1/2" span 1/2" scale. Const. set Rubber driven \$4.00

## Grumman-F3P1



32" span. 1" scale. Const. Eff 1-8 h.p. 4 1/4" wide set. Rubber driven \$3.75 Price \$49.50



## BOEING PT17 GAS



35" Span. Can use 5 (1 M) motor in scale or B or C type motor U control. Set has scale rubber wheels and all spec. parts, ready cut wing \$9.95 ribs, tail wheel unit and wheel. Const. set

Add 20c for postage. Catalog—10c coin

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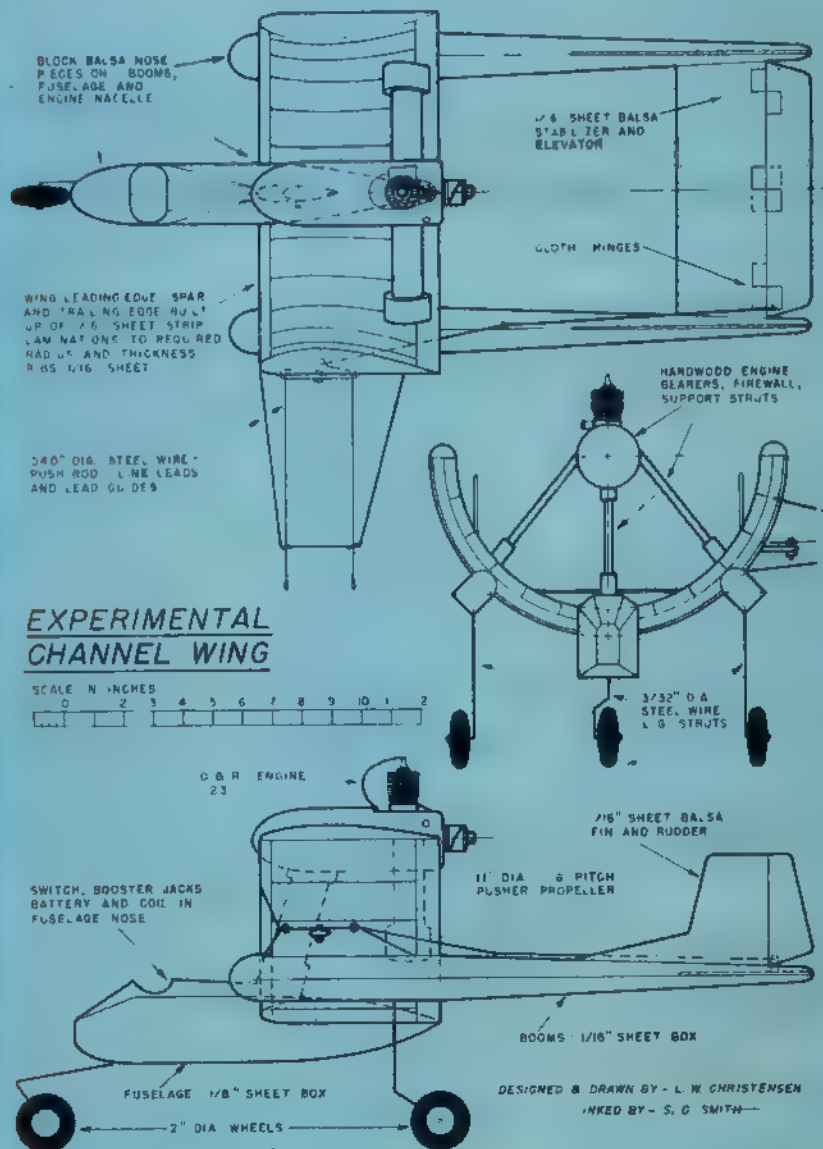
# CHANNEL WING MODEL

By L. W. CHRISTENSEN

Unique U-control job with semi-circular wing proves that there's something new under the sun

■ This model was designed after the Custer Channel Wing airplane. A single-engine design was decided on for two reasons: one was that getting two model engines to

run consistently and both at once was practically impossible, at least for me. Other reason was that I only had one engine at the time. So, after much sketching, the







present design was built. Building time required about a month of spare time, and the model flew on first trial, much to everyone's surprise including my own.

The model was entered in a U-control contest, sponsored by Northrop Aeronautical Institute, in combined scale and original event, and won second place by making its official and test flight at the same time.

The ship is a little heavy for the engine used, but flies well and is very stable. If the engine is running rich during flight, the model will maintain altitude by flying in a nose-high attitude. With engine running, the model stalls out when it reaches about a 30 degree angle of attack. I have dragged the tail booms on the ground with the main wheels still in the air.

I consider the landing gear set-up very stable because it handles pretty rough circles, and I have flown the model down and landed it under full power, then given full down control, whereupon the model would run around-circle on nose wheel alone.

On first flight, the ship may be taxied as long as desired, then lifted off slowly.



# Air Trails Blue Ribbon Model F-B VAMPIRE

40" span, 9" chord, wing area, 380 sq. in. Ready-built fuselage, die cut ribs, shaped and formed parts. Formed landing gear. **Class B-C ..... \$4.50**



**RECOGNIZED AS ONE OF THE HOTTEST STUNT SHIPS FOR '51**

**1ST IN DENVER-PLYMOUTH CONTEST  
1ST IN GOODLAND, KANSAS CONTEST**

**High altitude designed for tip-top  
contest performance coast-to-coast.**

**Also order:**

F-B Viking ..... **\$5.75**  
F-B Folly ..... **\$1.75**  
Baby Sky Box Stunt ..... **\$2.95**

Piper Vagabond ..... **\$3.95**  
Sharpy-Stunt Plane ..... **\$4.95**  
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**F-B MODEL AIRCRAFT — 3240 LARIMER — DENVER 5, COLO.**

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## POLK'S



Proudly  
Presents  
**THE BEST BUY IN  
RADIO CONTROL**  
AT NEW SPECIAL  
INTRODUCTORY PRICE

COMPLETE  
READY TO OPERATE **\$39.95**

You receive all this:

1: TRANSMITTER. 2: RECEIVER.  
3: ESCAPEMENT.

Prices Separately:  
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3: \$5.95.

**RECEIVER:** Carefully matched components to obtain 100% performance from the new 6AR5 fitted R.C. tube. Tunes by variable inductance eliminating difficult adjustments. Small volumetric size achieved by tubular case.



**TRANSMITTER:** 2AS Twin triode tube giving greater radiation than any other commercial transmitter. Up to four watts input. Entirely self-contained including 8-ft. sectional Aerial. This transmitter will double the range of any known carrier operated receiver. Satisfactorily checked by R.P.O. for frequency stability and output. Within 0.5% limits. Batteries 1.5 Volt and 1.5 Volt.



**ESCAPEMENT:** 100% reliability due to robust and accurate construction of claw and rotor. Fitted with double winding and current saving device, a feature first developed by E. P. Weight only 1/4 oz. Uses 3 Pen Cells.

**CHAMPIONSHIP, CRASHPROOF  
PERFORMANCE IN ALL PARTS  
OF THE WORLD**

'E-D' Radio Control Unit has built a proud, UN-FAILING PERFORMANCE reputation everywhere! Precision and rugged construction are basic! All auxiliary components, double on-off switch, meter and four-pin battery plugs and sockets, even solder is included!

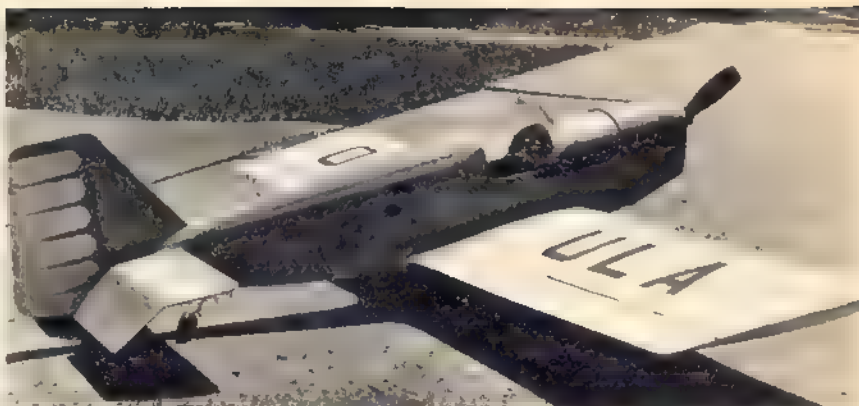
Receiver weighs only 1 1/2 ozs. Uses two 22 1/2 volt batteries, one 1 1/2 volt pen cell. Your best buy for contest, experiment or pleasure! (MAIL ORDERS: Send check or money order, add \$1 to cover packing and delivery).

**DEALERS:** Rush your order to Polk's at regular trade discounts. Also: Enjoy the convenience of single shipment wholesale service for: Airplanes • Engines • Supplies • Accessories • Railroads • Ship Models • Art Supplies • Books • Constructional Finished Parts Ship Models with Fin shed Displays.

**POLK'S MODEL CRAFT HOBBIES Inc.**

Dept. AT-10

314 Fifth Avenue, New York 1



From a 1949 issue of "AT" Ray Cohen, 20, of Chicago, built this Topsy Junior. Plans enlarged 1 1/2 to take Glo-Torp. Wing area 415 sq. in.; "clank" tank permits full stunting.

## Scale TRIO

As is evident from this fine collection of scale model planes, AT is always interested in photographic evidence of what its readers are doing. Regular payment of \$5 is made for photographs used providing they are submitted to Air Trails exclusively. Photos should be at least 4 x 5 inches in size and on glossy paper. Use cardboard stiffener when mailing, include all data.



Reader Mike Alaimo of Lawrence, Mass., turned out this neat Northrop, the Sky Chief built for Frank Hawks. Span is 32 in., silver with red trim. Fully detailed cockpit. Engine: O&R 23.

## Simplikit

FOR BEGINNERS  
FOR ADVANCED

AN AIR TRAILS  
BLUE RIBBON MODEL



PEE WEE PUP

FOR .020 TO .049 CU. IN ENGINES



SUPER STUNT RUN

FOR .099 CU. IN ENGINES

EASY TO BUILD EASY TO FLY  
AT YOUR DEALERS NOW

Goy Products Company

MEMORPHIS • CHICAGO



Highly detailed quarter inch to the foot scale model of Republic F-47 made by Charles S. Johnson, Jr., Albany, Ga. Model suspended by wire, shot against sky using © filter.



# CURTISS P-40F

a "SPITTIN' IMAGE" model by MONARCH

## • MODEL of the YEAR •

MONARCH'S new Curtiss P-40 has won nationwide acclaim as the finest scale gas model ever created. For the very perfection of brilliant design—for PRE-FABRICATION that is remarkable both for outstanding craftsmanship and the faithful adherence to every line and contour of the actual airplane—for ease and speed of assembly—for sturdiness and realistic performance in flight—this CONTROL LINE model is in a class by itself. See it at your dealer now—and you'll agree that this is "THE PERFECT SCALE MODEL".



for All .045 to .099 engines

**\$3.45** by mail — add 20c

WINGSPAN . . . . 20 inches



**\$2.95** by mail add 15c

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WINGSPAN . . . . 34 inches

A masterpiece of precision PRE-FABRICATION. Amazing performance and breathtaking glide. The most efficient free flight design ever! Smooth, trim lines — precision shaped WHOLE SECTIONS — not sticks and sheets. There has never been a model like it. For the flights of your life, go SCOT-FREE!

The perfect all-purpose CONTROL LINE biplane for half "A". A beautiful airplane — COMPLETELY PRE-FAB'D

Wingspan - 18 in.

**\$2.50** by mail, add 15c



SWEET CHARIOT

MONARCH MODEL AIRCRAFT CO. Inc. Brooklyn 33, N. Y.

## Dope Can

(Continued from page 65)

an OK Twin in a (roughly) Burnelli-type job, 11 to 12 feet span. The other fellow's name is Marsdon Goard."

George Strader, Massena, N. Y.: "Maybe I am a die-hard free flight fan, or maybe I just don't want to give in to the newer craze—U-C. Not that I don't enjoy getting dizzy while thrilling the crowd at the local airport, because I do. I firmly think that U-C is here to stay, but to the younger modelers who have started out on power flights first with U-C models and as yet have not experienced the ultimate thrill of seeing a free flight taxi down the runway, lift its tail and without help from any one, say goodbye to earth for a beautifully balanced flight of one, two or more minutes—brother, they don't know what they're missing."

"I get carried away when it comes to this phase of model building (realistic free flight). But I have also had my spirits dampened, too, when the models forget to come back. Recently I have been experimenting using the small Half-A motors in planes designed to 'stick around' for awhile. This is one phase of the sport that has been sadly neglected. I know the well-known masters of free flight will want to burn me at the stake, but I personally can't see any sense in building a model that doesn't look like an airplane because the contraption was designed to fly to the moon—then they put a dethermalizer on it so it won't!"

Nameless Nat, Dunellen, N. J.: "After reading opinions and suggestions concerning the Navy Carrier event, I have reached some definite conclusions myself. How do they sound?"

"As I read the rules, the crux of the whole situation lies in the amount of

(Continued on page 80)

For Guaranteed All Around Finer Prop & Spinner Performance

## SCAMPER PLASTIC PROP



- Aerodynamically engineered
- Static balance tested
- High tensile strength
- Low impact resistance
- Crankshaft insurance
- Made of finest plastic available

Once you try it you'll see why its popularity has been unprecedented.

Size 5/2-3 **25c** ONLY

Size 6-4 . . . . .25c

Size 9-6 . . . . .40c

1/4" Brass Sleeve, 5c extra

Size 10-10 . . . . .65c

Size 11-8 . . . . .65c

## SCAMPER PLASTIC SPINNER

- Absolutely wobbleproof
- Flywheel action maintained
- Fits all standard props
- 4 sizes: 1 1/2", 1 3/4", 2 1/4" diam.
- Colors: Red, Black, Yellow, Silver



EACH **45c** ONLY

If your dealer can't supply you, order direct, enclosing 15c for packing and postage.

DEALERS! JOBBERS! Write!

H. & P. PLASTIC PRODUCTS CO., GRAFTON, OHIO

## You Can Build STRONG SLEEK MODELS



Control-Line  
Model

## with PLASTIC WOOD

**PLASTIC WOOD** molds right into the lines of your model. Won't chip, crack or split! Handles like putty... hardens into wood. Can be carved, sanded and sanded. Ready to use. Takes dope or paint.

**YOU'LL WANT** Plastic Wood Solvent, too! Makes a perfect filler when mixed with Plastic Wood. Solvent removes Plastic Wood from tools and hands. Solvent is also used as a dope thinner!

### FREE SAMPLE

"Slick New Tricks for Building Better Model Planes." Ask your local model dealer or write Boyle-Midway Inc., 22 E. 40th St., New York 18, N. Y.



Swirl  
for patching  
broken halves!  
Take or Can



T.M. REG.  
U.S. PAT. OFF.

## PLASTIC WOOD

A CELLULOSE FIBRE FILLER

**Don't Miss —**  
**FULL PHOTO STORY**  
**ON NATIONAL MEET**  
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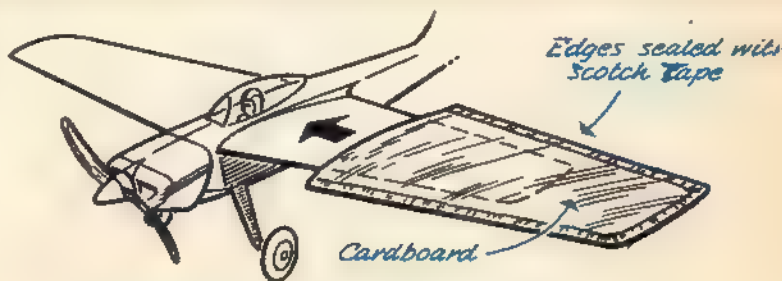
## The Viper AIR BOAT FOR 1/2A ENGINES



3 POINT SUSPENSION HULL, LICENSED UNDER  
APL VENTHON U.S. LETTERS PATENTS #2,129,304  
of August 9, 1938 and #2,481,063 of September 6, 1949

**COMPLETE KIT LESS ENGINE & SPINNER \$1.50**

**NORTH AMERICAN MODEL PROD'S.**  
5802 Warwick Road Hitten Village, Va.



Edges sealed with  
Scotch Tape

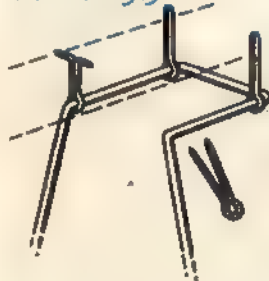
Cardboard

- Highly-finished or fragile paper-covered models can be protected during travelling by wing sleeves—  
From Mike Adajian, New Britain, Ct.

Plywood former  
or firewall

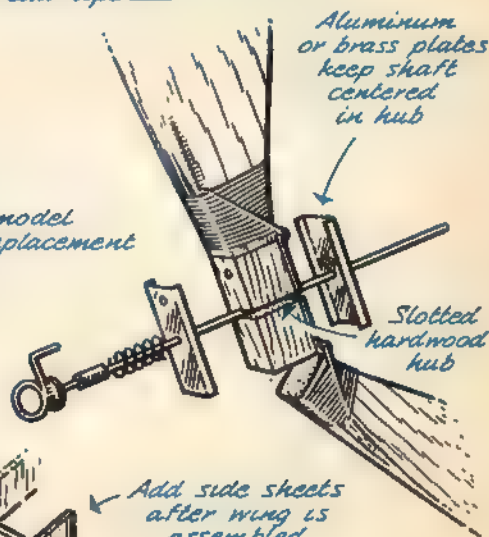


Select cotter pin  
size to fit gear  
wire snugly

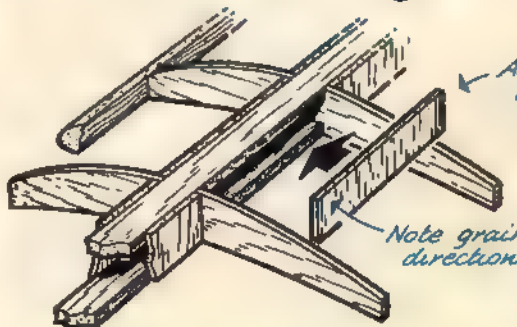


- Bill Halpain, Sulphur, Okla., finds ordinary cotter pins dependable for quick attachment of wire landing gear member. Mount to firewall or engine bearers, spread tips—

Aluminum  
or brass plates  
keep shaft  
centered  
in hub



- Removable rubber model propeller facilitates replacement and winding reports  
Tom Mallettis, Jr.,  
Staten Island, N. Y.



Add side sheets  
after wing is  
assembled

Note grain  
direction



- Extra strength & lightness & simplified assembly are advantages of "box" wing spar for large rubber, gas models—Submitted by:  
Yves Allouche, Quebec, Canada

- Plastic deodorant bottle, washed & filled with water, makes handy tissue sprayer, suggests  
Richard A. Wood, Darien, Conn.

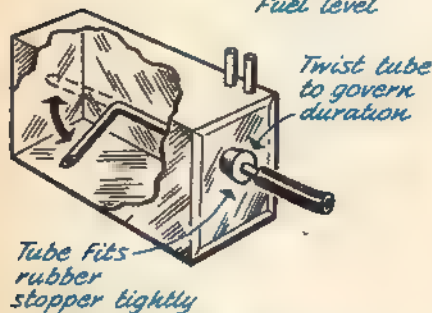
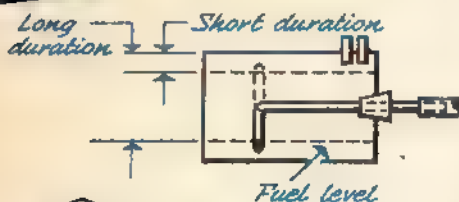


• Pipe cleaners, kept in kit box, serve as disposable "brushes" for quick field repairs — Patch

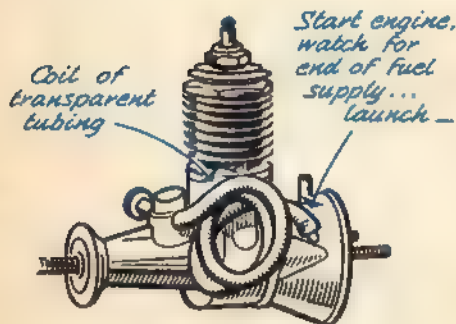


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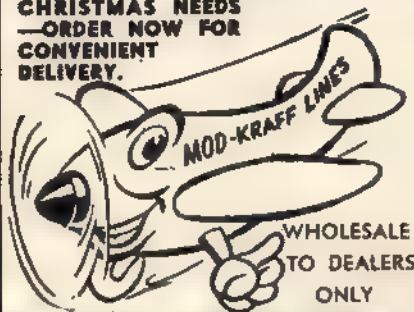
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Jack Ehlam's "Scooter" team racer has won beauty event trophy at Santa Anita, Calif. Cowl splits along the side for free and easy removal. Six more being built by club-mates.

**WESTERN**  
*Roundups*

■ After a long, long drought U-control contests have sprung up all over the West. Olympia held the Washington Control Line Carnival which proved to be the second largest meet there during the past twelve months, even though it was advertised for a period of only three weeks before the contest. This meet, like so many others held out West, pointed more to novelty and variety than to speed and stunt.

One very interesting event was a U-control payload for powerplants under .36 cubic inch displacement. The removable payload had to be carried internally or in a securely attached pod. The objective was to carry the most weight for a minimum of one-half mile on at least sixty-foot lines. Sounds like a good deal; only one question: must the landing be safely made without nosing over?

Another was a cross-country refueling event where the objective was to log the most time in the air in a ten-minute period with a minimum of two dead stick landings. This limitation stops one from using a real big tank and staying in the air

all the time. In an event like this, the feverish activity in the pits during stops makes one break out in a sweat just watching. These stops also make the helper very important. This event as well as the 150 lap "rat races" are won on the ground; the ones who refuel and get started the fastest are usually the winners.

The W.A.M. held another of its meets at San Jose and found Chet Haworth Jr. of the Alameda Model Engineers setting a new endurance record. Chet flew an original design powered with a glow plug Drone for 1 hour, 28 minutes and 45 seconds. A total of 677 laps were flown at an average speed of 32.68 mph. The ship used up 1½ quarts of fuel for an average of 171.87 miles per gallon. Flying in this event seems a sure way of getting dizzy.

These fellows of the Western Association Modelers have a type of speed model not generally flown at most contests which they call the Proto-Speed. They allow no helmet, cowls, have a minimum span for each class and a generally realistic ship. These are in a sense similar to the team racers. As with all well intended rules, some of the fellows are trying to cut them by adding fins behind the helmet cowls, calling it a fairing and therefore a proto job. Also, some of the ships seem to have shrunk in size since built. According to Dale Root who puts in a good beef, wings on some of the Half-A jobs look a little undersize. The satisfying thing about all this, says Dale, is that the winners are all well within the rules. Tut, tut, fellows, naughty, naughty.

Another big gripe Dale has, is belittling the appearance points. Seems as though the boys get the idea that some judges get a kick out of knocking off as many points as possible. The idea of giving the best-looking





Douglas DC-3 by R. J. Plumley of Comptons, Calif. Powered by 2 Torp 29's. Has built-up planked wing, tail-hollowed fuse.

ship max points and judging the rest accordingly, has been lost in the shuffle. This method will work out best because there can never be any comparison between different contest points since they never have the same judges at any two meets.

Anaheim had a real meet, the first big one for the Southern California gang. There was top-notch flying Scale models were super, the team



Two Fox 35's fly this Douglas A-20 built by James Devitt. Features shock gears, turret guns, movable ailerons and rudder.

event turned into a tough race with the La Mesa Airfoilers trying to get eight-count 'em—eight ships dog-fighting in the same circle. Due to lack of help, they managed to get only six ships in the air at once. Even so the near misses and streamer-cutting kept the crowd mighty well pleased. Every moment packed with excitement.

One very novel event eliciting a lot of interest (Continued on page 74)



Arland Wright's F-51 is fondly called "Lover's Lane." Uses inverted Torp 32. Ship is built-up and planked, weighs 3 1/4 lbs.

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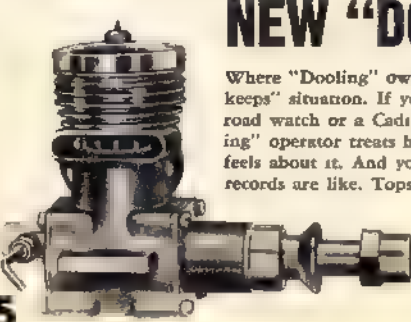
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(Continued from page 73)

was the stick breaking, which required a fellow to break a piece a quarter-inch square between each maneuver. Since these balsa strips were set in a platform on the ground, some very tight flying was called for. Several contestants, realizing they would overshoot, actually dove their ships into the deck. In most cases those who did so broke only a propeller and bent back their landing gear.

Marv Becker of La Mesa had the toughest luck in this event. He hit the arm of the fellow putting out the sticks on his first attempt and completely washed out his super-nice stunt job. Since this was an accident, he was given the opportunity to use a second ship—and what happens? One of the strangest things we have ever witnessed: his glow plug unscrewed in flight. Looks as though it was not meant for him to fly in this event.

Chuck Baker, C-D for the meet, says they used up more than 300 pieces of balsa in the "stick trick." One little fellow was seen to carefully pick up all the pieces after each flight and wrap them in his jacket. He finally had to give up, having more wood than jacket.

Bill Alford really pulled a good one. He doesn't do too much flying, but spends most of his time helping Dennis. At this contest Dennis repaid him for the help. Bill had to have his son out in the circle while he was flying—now get this—to tell him the flight pattern. Dennis kept him straight too.

Those scale jobs, man oh man! Practically all the guys entered in the meet spent more time giving them a very close inspection than they did flying.

S. Estrada with his Champion powered Navion won as usual, since he has everything but the real engine duplicated. Arland Wright's F-51 called "Lover's Lane" was close on his heels. James Devitt's Douglas A-20 came in third. Beautiful ships, all of them.

It was especially gratifying to note a trend in realism in some stunt ships. Cliff Potts and Marv Becker, to name just two, had very interesting planes. Cliff's ship was a little like a Grumman, with a N.A.C.A. cowl on his sidewinder Torp 29. Finished in blue and red, it looked real nice and really moved through the pattern.

Becker's ship was a modified Vics job with tricycle gear, pants on the wheels, cowed, inverted Torp 29, most pretty. Yellow and black, very smooth finish, this ship is also very fast. Nice going, men.

We ran into two fellows new to the West, Artie Scholl and Karl Kortials from Milwaukee. They came out to see about school at Northrop, heard about the contest, proceeded to get busy and showed up at the meet with a plane. That's model builders for you.

On the way to the U-control meet we stopped off for a look-see at the R-C activity. There was plenty of it. Ships ranging from Half-A jobs to those very popular Rudder-Bugs.



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Colby has a micro-switch which cuts out the elevator circuit. His motor control is very simple and likewise effective. He uses two needle valves and two fuel lines; the motor runs fast with the second valve out. When the relay is actuated, it lifts the valve in the K&B shut-off and allows more fuel to get to the engine, thus slowing it down. Real nice. His ship shows very good construction, all the wiring very neat. Slotted wing and tryke gear.

W. S. Deans had the first Rockwood set we have seen. He uses motor-rudder and elevator. Deans' motor was one of the very few ignition jobs; he advances and returns the spark arm for motor control.

Andrew Bauer from Columbus, Ohio, who had been in California just one week, had a small forty-four inch wing-spread semi-midwing Mac 19 job, which looks like a racer.

There were plenty of other ships there; the boys were having a big time. It was sure nice to see that they have found a fine place to fly, an old abandoned airstrip south of Santa Ana. Lots of room and a secluded spot.

Speaking of flying sites, the L. A. gang now have a real location in the Sepulveda Basin. Our first glimpse of this site was a joy to behold, acres and acres of flat ground with no obstructions. The (Continued on page 78)

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This little job here is a 1909 Hupmobile. As kitted by Fador Mfg. Co. (501 E. Chnton St., Elmira, NY) it's a 5 1/2" wheel base job, Smallster line, \$2.50.



Prefab Flyers

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PDQ Super Clown

Philadelphia flash is the PDQ Super Clown stunt plane. \$2.95 by PDQ Products Co. (Tulip & Dauphin Sts., Phila.) Span is 38 inches, takes .23 to .45 motors.



O & R's Latest Catalog

Ohlsson & Rice (3344 Emery St., Los Angeles) has interesting 15¢ 1951 catalog. Covers: model aircraft engines, marine engines, racers, glow plugs, fuel.



Packed Full of Items

The '51 catalog on planes, boats, crafts and vehicles issued by Electronic & Hobbycraft Stores, Inc. (130 W. Chelton Ave., Phila.) for 25¢ is loaded.



Storey's "Quest"

This is Keith Storey's team racer "Quest" kit by Berkeley Models (West Hempstead, LI, NY). \$4.95. (.23 to .36 disp.) Metal cowl, canopy, gear formed.



Takes B & C Motors

Capable of executing the entire stunt pattern is this \$5.95 Ryan ST, says its maker, Sterling Models (1530 N. Hancock St., Phila., 22). Metal cowling.



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Carriage

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too good. Test flights with these ships indicated not too much trouble getting off with 11½ ounces of weight, while flight times under these loads made the fellows believe that even greater loads could be carried.

Dick Sladek made some preliminary calculations for this type of model and found the following to be true. Build a model of 340 square inches of wing area, construct the wing for a lift coefficient of .9, which is fairly low, speed necessary to sustain flight at 17 mph. Equal or exceed these figures and it is possible to lift 18 ounces of load if the model weighs five ounces. In other words, the maximum model weight with load can be 21 ounces. Experience has indicated this to be very true.

The Tow Glider event proved to be tougher than expected. No trouble in take-off but an oscillating tow made flights almost impossible with all points used, except a double line from wing to wing. Dick Sladek was the only person who managed to get any semblance of flight. He missed making any official flights merely because time did not allow him to build in a glider release.

The Half-A event proved to be the most popular, having practically all the contestants in this class. Times were fairly high. Dick Everett won first in open with a total of 14.51, his longest flight being 6:08. Russ Wilson could have pushed this except for a stubborn dethermalizer which did not pop high enough. Tom Moffit won Junior-Senior Half-A for his third win with his "Paakid." Some of the fellows even

used Mills Diesels, but the ships were too heavy and had take-off troubles.

The sixth NCCFC meet proved to be one of those things. On the day of the contest the Air Patrol notified the officials that there was a special radar program on that day and didn't want them to fly. It took a lot of talking until they were given a small section in one corner of the field to fly. Then the wind—ships going out of sight so fast that some fellows decided not to fly.

Another Junior made himself seen and heard at this contest, Gale Strom-

berg of the S. F. Vultures. All he did was win a first and two seconds; against some pretty fair flyers, too. Congratulations, Gale. Keep it up.

Lyman Armstrong had a busy time punching T.S. cards at the second Annual Marysville contest. Seems like the fellows didn't like the \$150 entry fee and the ten-minute limit. Getting old, boys? Is the ten too long a chase? Johnny Murphy, Deputy Sheriff, did a swell job locating the lost models, flying a full-size ship all day long, taking the guys up and spotting



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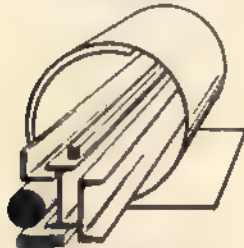
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One of those very rare ties came about in Class B when Dan Sullivan and Gale Stromberg (that fifteen-year-old again, and both Juniors, incidentally) tied with a 17:25 total. Dan was awarded second due to his shorter engine runs, with totals of 47 seconds against Gale's 50 seconds. Seems like a hard way to decide a contest, but—any other ideas?

One sad item which we have left for last is that of models being picked up along a road and carried away by persons unknown, leaving a hot, tired model builder very down-hearted at having his prize model spirited away. This happened at the Plymouth eliminations to Tom Moffit, when his new Class A payload ship powered with a Torp was picked up by a passing motorist.

The laws in California specifically prohibit this but to no avail, since it is usually impossible to catch such a culprit. Perhaps one good way to entice finders into returning models is to put a little note on them such as one English fellow does: "This is an experimental model presently undergoing tests, if found please notify John Smith so that the tests may be completed." Looks like a good idea, why not try it?

—DICK EVERETT

## Dope Can

(Continued from page 69)

difference between high and low speeds, since points are the same for all scale models and take-off and landing points are the same regardless of form as long as the requirements are met. Now comes the stroke of genius that sets me off from other ordinary, less modest people.

"With careful construction, as light as possible, and a good smooth finish, top speed of most models should not fall much below 50 mph. Now, what speed would give the maximum difference? Naturally, it would be the minimum possible. Now supposing this low speed was zero? How? you ask. Simple. If a model could be put into an inside loop and held there until the contestant tires. Since the model has not progressed any around the circle, its relative speed has been nil. There are any number of scale models which are capable of such aerobatics: the F4B, the F3F or the P6E.

"Now with one of these ships with the maximum permissible wingspan of 44" and a good reliable engine, good stunt performance should result. Even a speed of 20 to 30 mph would give you 30 mph difference.

"Here's another one: If the model were inverted and flown in that position, it would technically be going backwards, would it not? This way it is possible to obtain a negative forward speed. Boy, would those points pile up with a fast ship, eh?

"Oh, well, it was an idea, anyway, and I'm just passing it on."

**Willing to Write.** Horace V. Williams, 409 Lancaster Ave., Monroe, N. C. would like to correspond with German solid modelplane enthusiasts between the ages of 13 and 20. Horace is building a collection of 1/4" to the foot scale models from the earlier planes up to the present time.

Ted MacIntire, Royersford R.D. 1, Penna., is looking for a pen-pal around 14 to 18 interested in U-control and free flight. Robert Zukowski, 2509 Edgar St., Pittsburgh 27, Pa., says he has back copies of AT and other magazines. He'd like to pass them on to interested

## PHOTO CREDIT LIST

Pages 19-20-21—Charles Kaman.  
Page 24—Albert Rose.  
Page 62—J. Acker.

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parties. Write him for information.

Hellmut Malkmur, 10a Hinderburg, Fulda, Germany (U. S. Zone) is a member of an active model club which would like to correspond with American groups.

Grahame Melyen, 55 Adamton Road North, Prestwick, Ayreshire, Scotland, is 18, an aircraft apprentice at Scottish Aviation Ltd., Prestwick, whose main interests are control line stunt and free flight plus some scale building. He's a member of the Prestwick MC. Looking for a pen-pal for himself and also some American club which might write to his organization.

**ROTC Air Force.** There's a bantam-weight air force at the University of Illinois, Urbana-Champaign, Ill. Every Tuesday night, fair weather or foul, modelplane enthusiasts gather in the huge University armory where the air is filled with the snarl of midjet motors.

It is said this is the only model club under the sponsorship of AF Reserve Officers' Training Corps unit. The group has named itself the Illini Liners, since all flying is with line-controlled craft. Membership is open to everyone: ROTC cadets, other students, University staff members, and people of all ages from the community. At present there are 30 members. A gallery of 150 to 200 spectators often turns out to watch the flying.

The armory, 99 feet high, 200 feet wide, 400 feet long and with unobstructed floor space, provides ample room for two circles to operate at the same time. Starter carts and batteries are supplied by the Army ROTC transportation corps unit—a nice sign of interservice cooperation!

Lt. Col. F. W. Dooley, CO of the AF ROTC unit, is a frequent visitor. As a matter of fact, part of his office space serves as a store area for the models between flying sessions. Lt. David H. Brazelton is president of the Illini Liners. Dave is from Normal, Ill., and



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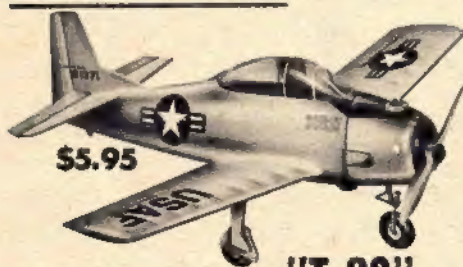
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### "MINNOW"

.19 to .36 Engines — 28" Span

Completely Pre-fabricated, featuring the "Step-Keel" Fuselage construction.

### P-51 "MUSTANG"

37" SPAN - .19 TO .35 ENGINES

This Deluxe kit incorporates a landing gear which may be retracted or extended at will, including the tail wheel. Automatic flaps, engine throttle control as well as elevator and "Autotrol" rudder operation make this laminar-flow airfoiled fighter an outstanding controller. A specially machined four-notched aluminum spinner is included.



\$4.95

### F-8-F "BEARCAT"

35½" SPAN - .29 TO .65 ENGINES

"Autotrol" automatic rudder control with ground-operated "U-Control" elevators, prevent slackening of lines in critical maneuvers.

### P-47 "THUNDERBOLT"

40¾" SPAN - .29 TO .65 ENGINES

Engine Throttle control and fully automatic wing flaps make full scale-type flights possible with this famous battleship of the air. A special feature of this outstanding performer is the shear-pin motor mount.

\$4.95

"Manufactured under license, Jim Walker's 'U-Control' Patent No. 2292416, and Bill Effinger's 'Autotrol' Patent No. 2523902. 'Controlines' is registered trade mark of Berkeley Models, Inc., West Hempstead, N. Y.

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has long been considered a normal model builder. (Ouch!) He built his first model at 8, started to fly at 15, was a licensed pilot at 17, and while attending Illinois U. went through the Air Force ROTC to earn a commission.

**Bison's 180 Lap Races.** We've had some requests for data on how the Flying Bisons of Williamsville, N. Y., run off their 180 lap races which we've mentioned here from time to time. Here is the dope as provided by the club:

**180 Lap Races**—an open event for any and all modelers. You don't have to be a contest flyer to participate. The event is very simple; three flyers are given a signal to start, they must start their engines and proceed to fly for 180 laps or 15 miles when 70 foot lines are used. During these 180 laps they must land and restart their engines at least two times; the flyer to complete 180 laps first is the winner.

The model—any type is eligible, no restriction on design; model must have a workable landing gear.

The classes—Half-A, up to .09 cu. in. disp., 35-foot lines, .008 in. min. dia.; Class A, .09 to .19 cu. in. disp., 52½-foot lines, .010 min. dia.; Class B, .19 to .29 cu. in. disp., 60-foot lines, .012 min. dia.; Class C-D, .29 to .85 cu. in. disp., 70-foot lines, .016 min. dia.

The flying rules—contestants will be assigned to groups of three for their first heat flights in each class; the winners of each heat will then fly off in groups of three until a final winner in each class is determined; a take-off area will be set up, all refueling and restarting will be done in this area; flyer must leave the center of the circle while refueling and restarting, only one mechanic allowed for each flyer; man who is passing must pass high, others must give way to him; models must be kept below a 45 degree angle except in emergencies; this is a fun event and everything will be done to keep it as such, any deliberate fouling will be cause for disqualification.

**People.** Lt. Don Murray of Detroit who has been active in past Plymouth International contests is back in active service with a B-36 Recon outfit. John Young, one of the original members of the Jasco outfit, now in Hagerstown, Md., (he runs Deco) was married recently to Jane Sweigert. Edgar D. Hall, AN, FASRON 103, U. S. Naval Air Station, Patuxent River, Md., is most interested in getting plans for Bill Gibson's Arrow which appeared many years ago in "AT"—anyone got a set he can send Ed?

## Nationals

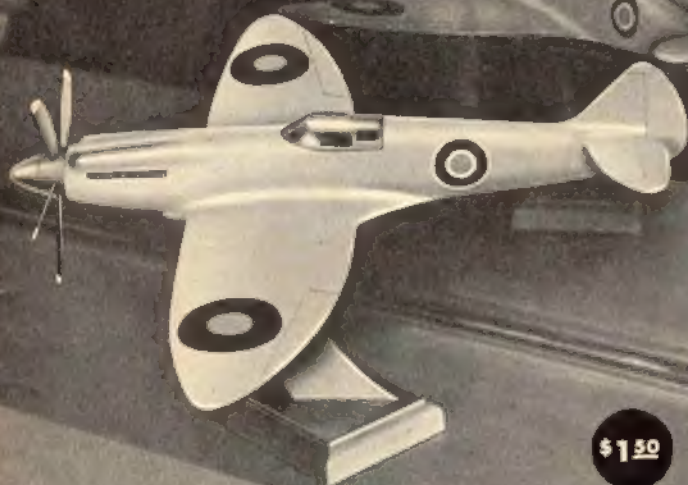
(Continued from page 31)

Cargo event which did not count toward national championship points, 1st was taken by Randolph La Matt, Dallas, with a Wasp powered job that carried 14½ ounces! Daniel Simenson, Sheppard, Texas, was second with a Wasp .049 carrying 13 oz. Ted Grzeszczak, Jersey City, N.J., used a Wasp to carry 11 ounces for 3rd.

When all the shouting and computations were over Paul Simon 18, of Detroit was declared National Champion. Gene Jackman won the junior title and Bob Bienenstein, also of Detroit, took open class honors. Carl Goldberg was awarded the June Pierce Memorial Trophy for outstanding sportsmanship. The Detroit Balsa Bugs walked off with the best club award. Among the many dignitaries present at the award ceremonies were Navy air admirals and Cmdr. Arthur Godfrey—billed as the Navy's advertising manager! How true.



**SPITFIRE MK-19**



**\$1.50**

**F-86 SABRE JET**



**\$2.00**

**MIG-15**



**\$2.00**

**FOR YOUR DISPLAY COLLECTION**

*You're gonna want all 3...*

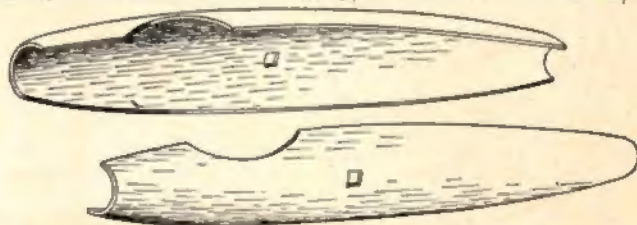
**OF THESE OUTSTANDING NEW AUTHENTIC SCALE MODEL KITS**



**ALL PARTS SHAPED AND READY FOR ASSEMBLING**

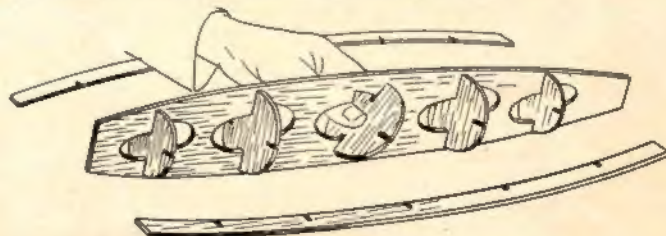
Testor certainly set a new high standard of quality with the development of this outstanding series of authentic scale model airplane kits! History-makers from the headlines of World War II and Korea, they are masterpieces of detail and design... impressively realistic in appearance... wonderfully easy to build because all parts are shaped and ready for assembling. You will want all three for your display collection, because they make an impressive grouping that will delight your friends and give you new pride of craftsmanship! *See your dealer now...*

Model	Wing Span	Overall Length
Spitfire.....	17-1/2"	16"
F-86 Sabre Jet.....	17"	19"
MIG-15.....	15-3/4"	16-1/4"



### **MOLDED Balsa Parts**

Fuselage half-sections and wing half-sections are actually molded into shape! This production process is an important new Testor development that simplifies and speeds construction... adds realism to appearance... makes possible a more perfect finish on your model.



### **KEY-LOK ASSEMBLY**

Note how formers fit securely into place in the keel section with the simple slot-slide action of a key turning in a lock. This exclusive construction technique (patents pending) insures positive location and correct alignment of parts... gives your model greater strength... saves you building time and work.





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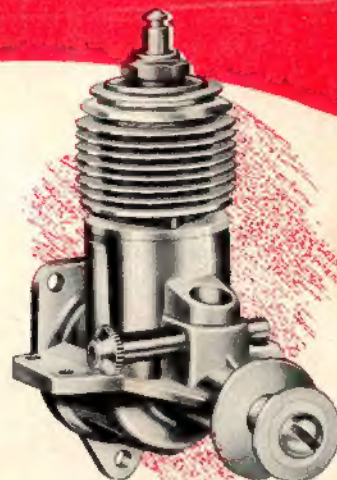
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Packs a wallop! Most powerful engine in its class! Patented part design — an "OK" exclusive — provides greater turbulence, effective scavenging, higher power/weight ratio.

Displ. — .074  
Bore — .479  
Stroke — .415  
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Weight — 1½ oz.

**Only  
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## GLOW FUEL

Unlike some fuels, "OK" Glow Fuel operates over a wide range of climatic conditions.

**85c**



## OK CUB .049

### power kit

A \$6.15 value — assemble it yourself and save \$1.20! How's that for value!

**ONLY \$4.95**



CUB .039  
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CUB .049  
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CUB .099  
**\$6.95**



## COMBINATION PACKAGE

(Includes assembled engine, prop and tank.)

CUB .049 .....	<b>\$5.75</b>
CUB .074 .....	<b>\$6.75</b>
CUB .099 .....	<b>\$7.75</b>



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